

NOTES ON BROMELIACEAE, XXXI

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KEY TO TILLANDSIA AND SIMULATORS

The present revision aims to record all the changes that have taken place in Tillandsia since Mez's monograph in the Pflanzenreich in 1935 as well as a number that he missed because his work was in press. This will serve to prepare the ground for the second volume of my monograph in the Flora Neotropica, namely the subfamily Tillandsioideae. Everyone will have a chance to criticize and my final draft will be that much better.

In this key I have included a number of vrieseas that have been mistaken for Tillandsia or that easily might be and also some guzmanias with simple inflorescences for the same reason.

Although the key is frankly artificial and the species are listed alphabetically afterward, I have placed an estimate of its subgenus after each one. I am using the same subgenera as Mez, except that I have reduced Pityrophyllum to subgenus Tillandsia (Platystachys in Mez) and Aerobia to Anoplophytum.

1. Sepals asymmetric, free, oblong or broadest near apex, rarely over 10 mm long; flowers distichous, sometimes becoming secund.....Subkey XII (Tillandsia subgenus Pseudo-Catopsis)
1. Sepals symmetric, or if slightly asymmetric, then ovate or lanceolate, broadest near base.
2. Leaf-blades narrowly triangular and tapering evenly from base to apex or linear and not over 2 mm wide.
3. Flowers polystichous (more than 2-ranked); inflorescence simple.....Subkey VIII
3. Flowers distichous (2-ranked) or solitary, sometimes turning secund at anthesis.
4. Plants caulescent; stems evenly leafy, not rhizomatose; leaves not rosulate nor fasciculate; flowering shoot short or of medium height; inflorescence not more than bipinnate.....Subkey I
4. Plant stemless, but sometimes bearing rhizomes; leaves rosulate or fasciculate.
5. Lower primary bracts (exclusive of blades) equaling or exceeding the axillary branches.....Subkey VII
5. Lower primary bracts shorter than the axillary branches or the inflorescence simple.
6. Leaf-sheaths convergent at their apices, inflated and forming a pseudo-bulb, nearly concolorous with the blades to somewhat ferruginous.....Subkey VI
6. Leaf-sheaths divergent and not forming a pseudo-bulb even if somewhat inflated (some species with sheaths subinflated but dark castaneous or purple).
7. Floral bracts broad, densely imbricate and covering the rhachis at anthesis or flowers solitary.....Subkey II

7. Floral bracts spreading or so narrow as to expose the rhachis at anthesis; spikes lax to subdense.
8. Flowers (exclusive of petals) contiguous with each other or at least with the rhachis.
 9. Floral bracts and flowers (exclusive of petals) imbricate, more than twice the length of the internodes; spikes subdense.....Subkey III
 9. Floral bracts and flowers (exclusive of petals) less than twice the length of the internodes; spikes lax. Subkey IV
 8. Flowers (exclusive of petals) not contiguous with each other nor with the fully exposed rhachis, divergent to spreading.....Subkey V
2. Leaf-blades ligulate or subligulate, never tapering evenly from base to apex; flowers distichous (2-ranked), if appearing polystichous (more than 2-ranked) then the 2 bracts below each flower indicating 1-flowered spikes.
 10. Lower primary bracts (exclusive of blades) equaling or exceeding the axillary branches.....Subkey XI
 10. Lower primary bracts (exclusive of blades) shorter than the axillary branches or the inflorescence simple.
 11. Flowers contiguous; spikes dense or subdense.....Subkey IX
 11. Flowers not contiguous; spikes lax.....Subkey X

Subkey I

1. Leaves distichous (2-ranked).
2. Floral bracts 4-5 cm long. Argentina.....T. diaguitensis
2. Floral bracts ca 2 cm long at most.
 3. Stem several meters in length, exposed between alternating bunches of leaves. Southeastern United States to Argentina and Chile.....T. usneoides
 3. Stem rarely over 2 dm long, wholly concealed by the imbricate leaf-sheaths.
 4. Leaf-blades linear, usually obtuse, not over 2 mm in diameter.
 5. Sepals connate posteriorly; scape without bracts or absent. Peru, Bolivia, Paraguay, Argentina, Chile. T. capillaris
 5. Sepals free or equally short-connate.
 6. Floral bracts glabrous or scantily lepidote, at most barely longer than the internodes. Bolivia, Paraguay, Argentina.....T. bandensis
 6. Floral bracts densely lepidote, twice as long as the internodes or the inflorescence 1-flowered.
 7. Sepals lepidote; 2 or 3 scape-bracts immediately below the first floral bract; stem to 2 dm long. Peru, Chile.....T. landbeckii
 7. Sepals glabrous, or if lepidote, then only a single scape-bract immediately below the first floral bract.
 8. Sepals 12.5 mm long; (petal-blades suborbicular, 6.5 mm broad, blue or violet). Brazil.....T. malleontii

8. Sepals not more than 9 mm long, (much shorter within the range of T. mallefontii; petal-blades narrowly elliptic, pale violet or white). Southern United States to Argentina.....T. recurvata
4. Leaf-blades narrowly triangular, mucronate, usually well over 2 mm in diameter.
9. Leaves erect; sepals connate posteriorly; scape naked.
Peru, Bolivia, Paraguay, Argentina, Chile...T. capillaris
9. Leaves spreading or recurved.
10. Leaves rarely more than 2 cm long; scape not over 4 cm.
11. Floral bracts and sepals prominently nerved; floral bracts densely lepidote. Argentina.....T. angulosa
11. Floral bracts and sepals nearly or quite even, not more than sparsely lepidote. Argentina.....T. rectangula
10. Leaves 2-30 cm long; scape often elongate.
12. Scape none; inflorescence 1-flowered; (petals red).
Argentina.....T. albertiana
12. Scape evident; inflorescence usually more than 1-flowered.
13. Floral bracts glabrous.
14. Leaf-blades strongly angled; floral bracts and sepals even. Bolivia, Argentina.....T. funebris
14. Leaf-blades terete; floral bracts and sepals prominently nerved. Argentina.....T. castellanii
13. Floral bracts densely lepidote.
15. Leaf-scales with narrow spreading basal lobes that make the leaf tomentose. Bolivia, Brazil, Argentina, Uruguay.....T. crocata
15. Leaf-scales with broad basal lobes if any, broad and appressed or slightly divergent.
16. Stem 20 cm long, many times longer than the leaves; sepals connate posteriorly. Argentina...T. andicola
16. Stem not over 10 cm long, usually shorter than the leaves.
17. Leaf-blades laterally compressed; leaf-sheaths indistinct, but little broader than the blades, enfolding the stem only by their extreme bases.
Peru, Bolivia, Argentina.....T. gilliesii
17. Leaf-blades terete; leaf-sheaths distinct, much broader than the blades, enfolding the stem for most of their length.
18. Sepals equally subfree; scape usually elongate.
Bolivia, Argentina, Uruguay.....T. myosura
18. Sepals much connate posteriorly; scape 55 mm long at most. Argentina.....T. retorta
1. Leaves polystichous (in more than 2 ranks).
19. Scape in large part naked or else wholly lacking; inflorescence simple, 1-2-flowered.
20. Leaves not over 2 cm long.
21. Floral bract 1-nerved; leaves 4-9 mm long; leaf-sheaths 3-nerved. Peru, Bolivia, Argentina.....T. bryoides
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21. Floral bract several-nerved; leaves to 2 cm long; leaf-sheaths ⁴-many-nerved.
22. Leaves erect; inflorescence distinctly scapose in most cases. Argentina.....T. aizoides
22. Leaves spreading to recurved; inflorescence sessile. Argentina.....T. angulosa
20. Leaves 4-6 cm long.
23. Scape lacking; inflorescence sessile.
24. Leaf-blades filiform-attenuate, 1-2 mm wide; sheaths narrow. Colombia, Venezuela.....T. andreaea
24. Leaf-blades stout, 5 mm wide; sheaths ample. Mexico to Nicaragua.....T. ionantha
23. Scape developed.
25. Floral bracts densely appressed-lepidote; stem to 20 cm long. Argentina.....T. andicola
25. Floral bracts glabrous; stem not over 6 cm long.
26. Floral bracts prominently nerved; scape-bracts one or none. Argentina.....T. erecta
26. Floral bracts even; scape bracts 2. Bolivia, Argentina.
T. funebris
19. Scape present and nearly or quite covered by its bracts (when very short, then the inflorescence compound or simple and more than 2-flowered).
27. Flowers divergent to spreading, not contiguous with nor covering the rhachis at anthesis.
28. Floral bracts carinate and incurved toward apex, 15-20 mm long; inflorescence normally compound.
29. Sepals more or less exerted. Peru.....T. purpurea
29. Sepals shorter than the floral bracts. Ecuador, Peru.
T. straminea
28. Floral bracts convex, ecarinate (condition unknown in T. diaguitensis where they are 40-50 mm long).
30. Sepals about equaling or shorter than the floral bracts; inflorescence simple.
31. Floral bracts 15 mm long; leaf-blades 2 mm wide. Ecuador, Peru.....T. caerulea
31. Floral bracts 40-50 mm long.
32. Sepals subcoriaceous, subdensely lepidote. Peru.
T. truxillana
32. Sepals membranous, glabrous. Paraguay, Argentina.
T. diaguitensis
30. Sepals conspicuously exerted above the floral bracts.
33. Inflorescence simple; floral bracts to 21 mm long. Mexico.....T. albidia
33. Inflorescence compound; floral bracts 13-15 mm long. Peru.
34. (Petal-blades purple when dry).....T. humilis
34. (Petal-blades yellow with brown spots; species otherwise indistinguishable, cf. case of T. funebris).
T. aureo-brunnea
27. Flowers erect and contiguous with the rhachis and usually also with the floral bracts next above.

35. Floral bracts distinctly carinate toward apex.
36. Leaf-scales with narrow spreading basal lobes that make the leaf tomentose.
37. Inflorescence simple; floral bracts to 26 mm long.
Mexico.....T. ehrenbergiana
37. Inflorescence densely digitate; floral bracts about 10 mm long. Ecuador, Peru.....T. tectorum
36. Leaf-scales with basal lobes if any, broad and appressed or slightly divergent.
38. Spikes 2-5-flowered; inflorescence very densely compound with the spikes pressed tightly together.
39. Leaf-blades subulate-attenuate, 10-12 mm wide at base. Peru, Bolivia.....T. calocephala
39. Leaf-blades filiform-attenuate, 7 mm wide at base. Peru.....T. heteromorpha
38. Spikes 5-many-flowered, their apices distinct from each other, or the inflorescence simple.
40. Floral bracts obtuse; scape slender, elongate
Ecuador, Peru.....T. floribunda
40. Floral bracts acute; scape stout.
41. Leaves to 20 cm long; leaf-blades to 30 mm wide; inflorescence usually compound. Ecuador, Peru.
T. latifolia
41. Leaves 6-7 cm long; leaf-blades 6 mm wide; inflorescence simple (perhaps only an extreme form of T. latifolia). Peru.....T. arenicola
35. Floral bracts evenly convex, ecarinate or very obscurely carinate.
42. Posterior and anterior sepals ecarinate and indistinguishable; floral bracts never more than 17 mm long.
43. Leaf-blades soon glabrous, contrasting with the very dark castaneous sheaths. Costa Rica, Panama.
T. insignis
43. Leaf-blades wholly and persistently lepidote, concolorous with the sheaths.
44. Floral bracts 6-8 mm long; inflorescence almost always simple.
45. Spike linear, few-16-flowered; flowers lax, appressed to the strongly geniculate exposed rhachis. Peru, Bolivia, Paraguay, Brazil, Argentina, Uruguay
T. loliacea
45. Spike narrowly lanceolate, 1-5-flowered; flowers subdense. Bolivia, Paraguay, Brazil, Argentina.
T. tricholepis
44. Floral bracts 10-45 mm long.
46. Scales of the leaves appressed, subsymmetrical.
47. Floral bracts 45 mm long, much exceeding the sepals. Paraguay.....T. esseriana
47. Floral bracts 10-17 mm long, shorter than the sepals.
48. Leaf-blades stout, coiled; inflorescence mostly pinnately compound. Bolivia, Paraguay, Brazil, Argentina, Uruguay.....T. duratii

48. Leaf-blades slender, recurving but not coiled; inflorescence compactly bipinnate or simple. Bolivia, Argentina.....T. reichenbachii
46. Scales of the leaves with divergent basal lobes making the leaf shaggy or tomentose.
49. Plants short-caulescent; leaves much longer than the stem; inflorescence mostly digitately compound. Peru, Bolivia, Paraguay, Brazil.....T. streptocarpa
49. Plants long-caulescent; leaves mostly shorter than the stem.
50. Leaves strict. Paraguay.....T. arhiza
50. Leaves spreading. Colombia to Chile.....T. paleacea
42. Posterior sepals strongly carinate for most of their length, or if not (not verified in some species), then the floral bracts much more than 17 mm long.
51. Leaf-sheaths dark brown or castaneous and contrasting strongly with the blades.
52. Floral bracts 60-80 mm long; leaf-blades 30-50 mm wide at base; plants imperfectly known and doubtfully caulescent. Ecuador.
53. Scape erect; inflorescence simple.....T. petraea
53. Scape decurved; inflorescence compound.....T. cernua
52. Floral bracts 17-28 mm long; leaf-blades 10-30 mm wide.
54. Leaf-scales white, not masking the green of the leaf; blades not over 11 mm wide at base. Brazil..T. dura
54. Leaf-scales cinereous, completely masking the green of the leaf; blades to 30 mm wide at base.
55. Sepals lepidote. Colombia, Peru.....T. chartacea
55. Sepals glabrous. Ecuador.....T. queroensis
51. Leaf-sheaths pale and not contrasting with the blades.
56. Floral bracts orbicular, membranaceous, the lower ones long-apiculate. Cuba to Argentina.....T. tenuifolia
56. Floral bracts ovate or lanceolate, not (or very minutely) apiculate.
57. Spike terete, solitary, 1-few-flowered; floral bracts membranaceous, densely imbricate and concealing the rhachis.
58. Sepals glabrous; spike to 70 mm long. Mexico and the West Indies to Venezuela and Colombia. T. schiedeana
58. Sepals lepidote; spike not over 25 mm long, 1-2-flowered. Mexico.....T. ferrisiana
57. Spikes distinctly complanate.
59. Floral bracts densely and persistently lepidote.
60. Floral bracts ca 10 mm long; leaves tomentose-lepidote. Peru.....T. reducta
60. Floral bracts 20-45 mm long.
61. Sepals lepidote.
62. Scape elongate; scape-bracts elliptic; sepals ca 14 mm long. Colombia, Ecuador.....T. incarnata
- 62..Scape short; scape-bracts foliaceous; sepals to 20 mm long. Mexico.....T. lepidosepala

61. Sepals glabrous.
63. Sepals free, the posterior alate-carinate. Bolivia
T. boliviensis
63. Sepals posteriorly connate.
64. Leaves 3-4 cm long; scape very short or none. Peru.
T. macbrideana
64. Leaves to 16 cm long; scape evident. Mexico.
T. pueblensis
59. Floral bracts glabrous or nearly so; spike usually single.
65. Stem long and conspicuous, equaling or exceeding the leaves.
66. Spikes lax; floral bracts less than twice the internodes.
 Argentina.....T. peiranoi
66. Spikes dense or subdense; floral bracts distinctly more than twice the internodes.
67. Floral bracts 40-50 mm long.
68. Scape (including bracts) nearly as stout as spike; leaves many-ranked, suberect. Chile.....T. werdermannii
68. Scape much more slender than spike; leaves few-ranked, spreading. Argentina.....T. diaguitensis
67. Floral bracts 15-25 mm long.
69. Leaf-blades many times longer than the sheaths, greenish. Peru, Bolivia.....T. caulescens
69. Leaf-blades less than 3 times as long as the barely distinct sheaths, cinereous.
70. Floral bracts prominently nerved. Peru.
71. Inflorescence scapose; (petals blue or violet).
T. cauligera
71. Inflorescence sessile; (petals rose).....T. macbrideana
70. Floral bracts nearly or quite even. Argentina.
T. friesii
65. Stem shorter than the leaves, relatively inconspicuous.
72. Leaves reflexed-tomentose with very fine elongate scales; blades 8 mm wide. Bolivia.....T. cardenasii
72. Leaves appressed- or coarsely divergent-lepidote with suborbicular scales.
73. Scales closely appressed.
74. Leaf-apices filiform-attenuate, soft; floral bracts 30-35 mm long.
75. Floral bracts acute, nerved, plic. Chile.....T. geissei
75. Floral bracts broadly obtuse, faintly nerved, lustrous. Peru.....T. micans
74. Leaf-apices narrowed to an abruptly acute pungent apex. Argentina.....T. argentina
73. Scales more or less divergent.
76. Blades involute, 10 mm wide. Mexico.....T. pueblensis
76. Blades mostly flat, to 20 mm wide.
77. Scape elongate, largely exposed.
78. Floral bracts 20-25 mm long, barely exceeding the sepals; (petal-blades elliptic). Bolivia, Paraguay, Brazil, Argentina.....T. lorentziana
78. Floral bracts 25-40 mm long, much exceeding the sepals; (petal-blades suborbicular). Uruguay....T. arequitae

77. Scape short, largely hidden by the leaves; floral bracts 25-70 mm long. Bolivia, Argentina, Uruguay.

T. xiphioides

Subkey II

1. Inflorescence 1-3-flowered, simple; scape short or none.
2. Leaf-scales appressed, symmetrical; leaves ca 5 cm long.
Colombia, Venezuela.....T. andreana
2. Leaf-scales more or less spreading, extended on one side.
3. Blades subulate, stout, 5 mm wide; leaves rarely over 6 cm long. Mexico to Nicaragua.....T. ionantha
3. Blades filiform-attenuate, setaceous; leaves 10-15 cm long. Mexico to Honduras.....T. magnusiana
1. Inflorescence much more than 3-flowered, simple or compound.
4. Leaf-blades linear-subulate to filiform.
5. Floral bracts membranaceous, nerved, red; inflorescence simple. Mexico.
6. Leaf-scales orbicular, closely appressed....T. chaetophylla
6. Leaf-scales linear, spreading.....T. ignesia
5. Floral bracts coriaceous or subcoriaceous, even to nerved; inflorescence usually compound.
7. Spikes arching-recurved; floral bracts scarcely more than twice the internodes, usually nerved. West Indies, Mexico, Central America.....T. festucoides
7. Spikes straight, erect or suberect.
8. Inflorescence densely digitate.
9. Floral bracts soon glabrous; sepals to 13 mm long; (stamens included). Ecuador, Peru.....T. floribunda
9. Floral bracts densely lepidote; sepals 15-20 mm long; (stamens exerted). West Indies and Mexico to Venezuela and Bolivia.....T. juncea
8. Inflorescence laxly pinnate or simple.
10. Floral bracts glabrous, 20-25 mm long. Mexico.
T. ortgiesiana
10. Floral bracts lepidote or if glabrous then much smaller.
11. Leaf-sheaths 15-20 mm wide; blades of the primary bracts generally exceeded by the axillary spikes.
United States: Georgia, Florida; Mexico...T. bartramii
11. Leaf-sheaths smaller; blades of the primary bracts generally exceeding the axillary spikes.
12. Floral bracts densely appressed-lepidote at least when young, 8-14 (-19) mm long; (stamens exerted).
South Carolina to Florida, West Indies and Mexico to Venezuela and northern Brazil.....T. setacea
12. Floral bracts sparsely lepidote, 10 mm long; (stamens included). Mexico, Guatemala, Salvador....T. remota
4. Leaf-blades definitely if narrowly triangular.
13. Floral bracts convex, ecarinate and without any extra thickening of the midnerve.
14. Posterior and anterior sepals all ecarinate and alike.
15. Sepals 27-40 mm long.

16. Spikes arching-decurved; inflorescence laxly bipinnate.
Colombia.....T. racinae
16. Spikes erect or suberect, few or solitary.
17. Leaf-blades cinereous; sheaths large, dark castaneous.
18. Scape very short, hidden by the leaves; inflorescence digitate. Mexico.....T. carlsoniae
18. Scape elongate. Ecuador.
19. Inflorescence simple, erect.....T. petraea
19. Inflorescence compound, pendent.....T. cernua
17. Leaf-blades green.
20. Inflorescence subdigitate; sepals brown-lepidote.
Colombia.....T. romeroi
20. Inflorescence simple; sepals glabrous. Ecuador, Peru, Bolivia.....T. walteri
15. Sepals 11-22 mm long.
21. Leaf-blades green. Brazil.....V. (13) triangularis
21. Leaf-blades cinereous.
22. Sepals 11 mm long; leaf-sheaths concolorous with the blades, inconspicuous. Bolivia, Paraguay, Argentina.
T. vernicosa
22. Sepals 16-22 mm long.
23. Floral bracts strongly incurved, fleshy, minutely rugulose and blackish when dry; inflorescence simple.
Panama, Colombia, Suriname, Brazil.....T. kegeliana
23. Floral bracts scarcely if at all incurved.
24. Scape straight, stout.
25. Inflorescence digitate; scape exceeding the leaves.
Colombia, Venezuela.....V. (4) robusta
25. Inflorescence simple; scape shorter than the leaves.
Ecuador.....V. (14) barclayana
24. Scape curved, slender.
26. Upper scape-bracts acute or obtuse. Costa Rica to Venezuela and Bolivia, Greater Antilles.
V. (3a) incurva, Phytologia 16: 458.
26. Upper scape-bracts long-flagellate with contorted linear blades. Ecuador.....T. flagellata
14. Posterior sepals carinate toward apex, distinct from the anterior.
27. Leaf-blades green, not notably cinereous.
28. Floral bracts not over 20 mm long; leaf-sheaths inconspicuous. West Indies and Mexico to northern South America.
T. polystachia
28. Floral bracts 30-50 mm long; leaf-sheaths conspicuous.
29. Inflorescence simple or rarely with a single lateral spike; scape short. Salvador, Honduras....T. cryptopoda
29. Inflorescence amply and densely bipinnate; scape elongate.
Hispaniola.....T. balliophylla
27. Leaf-blades cinereous (at least beneath).
30. Sheaths brown, darker than the blades and contrasting with them; floral bracts glabrous or glabrescent.
31. Sepals 12-22 mm long; leaf-blades 6-30 mm wide.
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32. Inflorescence densely bipinnate, ellipsoid; spikes 25 mm long; sepals 12 mm long. Peru.....T. cerrateana
32. Inflorescence laxly subdigitate; spikes 11-13 cm long; sepals 22 mm long. Colombia, Peru.....T. chartacea
31. Sepals 28-35 mm long; leaf-blades 3-6 cm wide.
33. Sepals high-connate posteriorly; inflorescence bipinnate; scape-bracts and lower primary bracts with subulate blades. Mexico, Guatemala, Salvador....T. xerographica
33. Sepals free or equally subfree. Ecuador.
34. Inflorescence amply tripinnate; floral bracts 36 mm long
T. indigofera
34. Inflorescence simple; floral bracts 60 mm long.
T. petraea
30. Leaf-sheaths pale, merging with the blades.
35. Floral bracts densely lepidote.
36. Sepals exerted above the floral bracts, to 26 mm long. Mexico.....T. exserta
36. Sepals covered by the floral bracts.
37. Inflorescence 3-5 cm long, simple or with a single small lateral spike; sepals 20 mm long. Mexico.
T. lepidosepala
37. Inflorescence 2 cm long, depauperately compound, dense; sepals 9 mm long. Peru.....T. reducta
35. Floral bracts glabrous or glabrescent.
38. Leaf-scales appressed.
39. Scape shorter than the leaves. Mexico..T. achyrostachys
39. Scape equaling or exceeding the leaves, to 4 dm long. Chile.....T. geissei
38. Leaf-scales more or less spreading.
40. Inflorescence densely digitate; scape decurved. Mexico.
T. matudae
40. Inflorescence simple; scape erect. Bolivia, Argentina, Uruguay.....T. xiphioides
13. Floral bracts carinate or at least the midnerve with extra thickening.
41. Leaf-blades green, not notably cinereous or ferruginous.
42. Upper scape-bracts and lower primary bracts laminate.
43. Leaf-sheaths brown beneath, darker than the blades and contrasting with them.
44. Inflorescence subdigitate, digitate or simple.
45. Floral bracts broadly ovate, to 4 cm long. Mexico to Costa Rica, Suriname.....T. punctulata
45. Floral bracts linear-lanceolate, 6 cm long. Ecuador.
V. (71) drewii
44. Inflorescence elongate, bipinnate or subtripinnate. Mexico.
46. Spikes 30-35 mm wide, thick; inflorescence broad with spreading spikes.....T. intumescens
46. Spikes 10-20 mm wide, strongly compressed; inflorescence narrow with suberect branches or spikes.
47. Spikes lance-ovate, 20 mm wide; inflorescence bipinnate
T. mexicana

47. Spikes lanceolate or linear-lanceolate; inflorescence usually tripinnate at base.
48. Floral bracts densely and evenly appressed-lepidote.
T. calothyrsus
48. Floral bracts glabrous.....T. rettigiana
43. Leaf-sheaths pale beneath, concolorous with the blades.
49. Floral bracts strongly nerved, shorter than the sepals.
Virgin Islands and vicinity.....T. lineatispica
49. Floral bracts nearly or quite even.
50. Floral bracts 15-25 mm long.
51. Spikes linear, 1 cm wide; leaf-blades concolorous.
West Indies and Mexico to Bolivia and Brazil.
T. polystachia
51. Spikes lanceolate, to 2 cm wide; leaf-blades dark-mottled. Peru.....T. piurensis
50. Floral bracts 30-45 mm long.
52. Inflorescence subdigitate.
53. Posterior sepals obscurely carinate; floral bracts suborbicular, apiculate. Colombia.....T. romeroi
53. Posterior sepals distinctly carinate; floral bracts broadly elliptic, acute. Colombia, Ecuador.
T. arcuans
52. Inflorescence elongate.
54. Spikes long-stipitate. Mexico.....T. roland-gosselinii
54. Spikes sessile. Colombia to Peru.....T. restrepoana
42. Upper scape-bracts acute or apiculate, but not laminate.
55. Leaf-sheaths dark, contrasting with the blades.
56. Scape elongate; leaf-blades much longer than the sheaths.
Mexico to Costa Rica.....T. tricolor
56. Scape very short and hidden by the leaves; leaf-blades only about twice as long as the sheaths. Salvador, Honduras.....T. cryptopoda
55. Leaf-sheaths pale, concolorous with the blades.
57. Floral bracts prominently nerved.
58. Scape erect, elongate; spike many-flowered. Peru.
T. lindenii
58. Scape ascending, short; spike few-flowered. Ecuador.
T. umbellata
57. Floral bracts even or nearly so.
59. Sepals 45 mm long, the posterior carinate. Ecuador.
T. pretiosa
59. Sepals 30-35 mm long.
60. Sepals in fruit not more than 4 mm wide, the posterior sharply carinate. Central America, Trinidad, northern South America.....T. anceps
60. Sepals in fruit 6 mm wide, the posterior very obtusely carinate if at all. Ecuador.....T. cyanea
41. Leaf-blades distinctly and densely cinereous- or ferruginous-lepidote (at least beneath).
61. Floral bracts densely lepidote.
62. Sepals 25-30 mm long. Mexico.
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63. Lower spikes several times as long as the sheaths of the primary bracts.....T. calothyrsus
63. Lower spikes less than twice as long as the sheaths of the primary bracts.
64. Floral bracts coriaceous.....T. bourgaei
64. Floral bracts membranaceous.....T. mexiae
62. Sepals 8-20 mm long.
65. Leaf-sheaths ample, dark castaneous, contrasting with the blades; inflorescence elongate.
66. Sepals 8-10 mm long.
67. Spikes much longer than the primary bracts. Venezuela to Bolivia.....V. (67) heterandra
67. Spikes (at least the lowest) less than twice as long as the primary bracts. Colombia, Ecuador.
V. (70) fragrans
66. Sepals 18-20 mm long.
68. Scape curved; primary bracts suborbicular. Colombia.
T. schultzei
68. Scape straight; primary bracts ovate. Mexico to Nicaragua.....T. vicentina
65. Leaf-sheaths small, pale, inconspicuous (sometimes purplish in T. latifolia); inflorescence short-pinnate.
69. Floral bracts distinctly nerved.
70. Spikes subsessile; inflorescence densely digitate. Mexico.....T. mauryana
70. Spikes with long bracteate sterile bases; inflorescence fan-shaped with all spikes in one plane. Bolivia, Paraguay, Brazil, Argentina.....T. didisticha
69. Floral bracts nearly or quite even or any nerves wholly obscured by a dense coat of scales.
71. Scales of the floral bracts suborbicular and scarcely lobed, dark-centered. Ecuador, Peru.....T. latifolia
71. Scales of the floral bracts filamentous-lacinate, pale-centered. Colombia, Venezuela, Trinidad, Brazil.
T. gardneri
61. Floral bracts glabrous or glabrescent.
72. Posterior and anterior sepals ecarinate, alike.
73. Floral bracts 9-10 cm long, narrowly oblong; sepals 40 mm long. Ecuador.....T. zarumensis
73. Floral bracts less than 4 cm long.
74. Sepals 10-13 mm long; floral bracts strongly nerved.
75. Spikes straight; inflorescence digitate. Colombia.
V. (65) crenulipetala
75. Spikes nearly all geniculate, spreading abruptly from the long erect sterile base. Mexico, West Indies, Venezuela, Colombia.....V. (69) didistichoides
74. Sepals 15-23 mm long; floral bracts even or faintly nerved
76. Inflorescence elongate.
77. Lower spikes much longer than the primary bracts. Peru.
V. (5) olmosana
77. Lower spikes less than twice as long as the primary bracts. Venezuela to Peru.....V. (10) tequendamae

76. Inflorescence subdigitate to simple.
78. Floral bracts equaling or exceeding the sepals; inflorescence simple. Ecuador.....V. (14) barclayana
78. Floral bracts exceeded by the sepals; inflorescence subdigitate. Colombia.....T. brevior
72. Posterior sepals sharply carinate, distinct from the anterior
79. Sepals 21-50 mm long.
80. Inflorescence subdigitate with the spikes longer than the axis, or simple.
81. Leaf-sheaths pale, concolorous with the blades. Mexico. T. concolor
81. Leaf-sheaths dark, brown or purple, contrasting with the blades.
82. Floral bracts thin and nerved when dry; scape very short and almost wholly hidden by the leaves. Salvador, Honduras.....T. cryptopoda
82. Floral bracts coriaceous, even or nearly so.
83. Leaf-sheaths purple. Mexico to Costa Rica. T. lampropoda
83. Leaf-sheaths ferruginous. Florida, West Indies and Mexico to northern South America.....T. fasciculata
80. Inflorescence elongate.
84. Spikes divergent to spreading; inflorescence lax to subdense.
85. Leaf-blades contorted; floral bracts but slightly carinate. Mexico to Honduras.....T. xerographica
85. Leaf-blades not contorted.
86. Sheaths pale, concolorous with the blades.
87. Sepals 30 mm long. Colombia.....T. restrepoana
87. Sepals 17-22 mm long. Colombia to Peru.....T. confinis
86. Sheaths ferruginous or castaneous, contrasting with the blades.
88. Lower primary bracts more than half as long as the spikes. Peru.....T. wurdackii
88. Lower primary bracts much shorter than the spikes.
89. Spikes thick; floral bracts verrucose when dry; posterior sepals alate-carinate. Mexico. T. intumescens
89. Spikes strongly complanate; floral bracts not verrucose.
90. Sepals equally subfree; spikes arching-decurved. Ecuador.....T. ampla
90. Sepals more or less connate posteriorly; spikes divergent. Florida, West Indies, and Mexico to Colombia and Guiana.....T. fasciculata
84. Spikes strict; inflorescence dense.
91. Lower primary bracts (without blades) about half as long as the axillary spikes or more.
92. Sepals 40-50 mm long. Mexico, Guatemala, Salvador. T. ponderosa
92. Sepals 21-30 mm long.
93. Floral bracts cucullate. Colombia.....T. suescana

107. Sheaths mostly inconspicuous; blades densely and persistently lepidote on both sides; spikes moderately complanate. Ecuador, Peru....T. latifolia

Subkey III

1. Posterior sepals sharply carinate for most of their length, distinguishable from the anterior.
2. Leaf-blades covered (at least beneath) with a solid coat of cinereous scales that completely mask any green coloration.
3. Floral bracts densely lepidote.
4. Sepals 8-15 mm long.
5. Floral bracts carinate.
6. Inflorescence fan-shaped with the spikes all in one plane
Bolivia, Paraguay, Brazil, Argentina.....T. didisticha
6. Inflorescence densely cylindric, tripinnate. Ecuador.
V. (66) appendiculata
5. Floral bracts convex, ecarinate.
7. Sepals lepidote; inflorescence simple or rarely of 2 or 3 spikes. Colombia, Ecuador.....T. incarnata
7. Sepals glabrous; inflorescence bipinnate from about 14 spikes. Peru, Bolivia.....T. rusbyi
4. Sepals 20-33 mm long.
8. Floral bracts exceeded by the sepals at anthesis. Mexico.
9. Inflorescence simple or subdigitate; spikes erect or suberect.....T. exserta
9. Inflorescence pinnate, its simple or divided branches spreading.....T. leucolepis
8. Floral bracts wholly covering the sepals.
10. Sepals lepidote. Mexico.....T. lepidosepala
10. Sepals glabrous.
11. Floral bracts coriaceous; sepals free. Bolivia.
T. boliviensis
11. Floral bracts membranaceous; sepals connate posteriorly
Mexico.....T. pueblensis
3. Floral bracts glabrous or glabrescent.
12. Leaf-sheaths brown to dark castaneous, contrasting with the blades
13. Sepals 16-22 mm long. Ecuador, Peru.....T. chartacea
13. Sepals 8-15 mm long.
14. Floral bracts carinate with the midnerve thickened.
15. Leaf-sheaths broadly ovate, 6-9 cm long, castaneous.
Colombia.....T. archeri
15. Leaf-sheaths ovate, 3-6 cm long, brown. West Indies.
T. canescens
14. Floral bracts ecarinate with nerves about equally developed.
16. Lower primary bracts lance-ovate, attenuate. Mexico.
T. gymnotrya
16. Lower primary bracts ample, caudate-acuminate.
Ecuador, Peru.....T. oroyensis
12. Leaf-sheaths pale, concolorous and merging with the blades

17. Sepals to 42 mm long. Bolivia, Argentina, Uruguay.
T. xiphioides
17. Sepals not over 18 mm long.
18. Floral bracts carinate; inflorescence fan-shaped with the spikes all in one plane. Bolivia, Paraguay, Brazil, Argentina.....T. didisticha
18. Floral bracts convex, ecarinate.
19. Floral bracts even except near apex; leaves gradually narrowed to an abruptly acute apex. Argentina.
T. argentina
19. Floral bracts prominently nerved.
20. Leaf-scales more or less spreading; floral bracts about equaling the sepals. Paraguay, Bolivia, Brazil, Argentina.....T. lorentziana
20. Leaf-scales closely appressed; floral bracts much exceeding the sepals. Florida, West Indies and Mexico to Venezuela and Bolivia.....T. valenzuelana
2. Leaf-blades not notably cinereous, the green coloring showing on both sides.
21. Sepals 30-40 mm long; floral bracts 40-50 mm long.
22. Inflorescence bipinnate; leaf-blades 40 mm wide. Mexico.
T. deppeana
22. Inflorescence simple or rarely of 2 spikes; leaf-blades 10-15 mm wide. Salvador, Honduras.....T. cryptopoda
21. Sepals 9-27 mm long.
23. Leaf-blades filiform-attenuate; leaves fasciculate; leaf-sheaths triangular.
24. Floral bracts thin, prominently and equally nerved throughout; inflorescence simple. Brazil...T. linearis
24. Floral bracts with the midnerve thickened apically but nearly or quite even basally.
25. Spikes arching-recurved; floral bracts scarcely more than twice as long as the internodes, usually much nerved. West Indies, Mexico, Central America.
T. festucoides
25. Spikes straight, suberect, dense. Georgia, Florida.
T. bartramii
- 23..Leaf-blades definitely if narrowly triangular; leaf-sheaths usually ovate or elliptic.
26. Sepals 21-27 mm long.
27. Inflorescence simple. Ecuador.....T. acosta-solisii
27. Inflorescence bipinnate, densely cylindric. Peru.
T. sagasteguii
26. Sepals 9-15 mm long.
28. Floral bracts even or nearly so.
29. Leaf-sheaths dark, contrasting with the blades; sepals 9 mm long. Ecuador.....T. barbeyana
29. Leaf-sheaths pale, merging with the blades; sepals 10-15 mm long. Florida, West Indies and Mexico to Bolivia and Brazil.....T. polystachia
28. Floral bracts prominently nerved.
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30. Sepals exerted above the floral bracts. Guatemala, British Honduras.....T. chlorophylla
30. Sepals wholly covered by the floral bracts.
31. Lower primary bracts with long linear blades that exceed the axillary branches; floral bracts 15 mm long. Costa Rica, Colombia, Venezuela.....T. longifolia
31. Lower primary bracts bladeless or with short inconspicuous blades that do not exceed the axillary branches; floral bracts 18-20 mm long. Mexico and Jamaica to Peru and northern Brazil.....T. elongata
1. Posterior and anterior sepals ecarinate, indistinguishable.
32. Sepals 10-14 mm long.
33. Leaf-blades strongly recurving to spiraling; sheaths short, suborbicular; plants sometimes caulescent.
34. Scales of the leaves with divergent basal lobes making the leaf shaggy or tomentose. Peru, Bolivia, Paraguay, Brazil.....T. streptocarpa
34. Scales of the leaves appressed, subsymmetrical. Bolivia, Argentina.....T. reichenbachii
33. Leaf-blades straight or nearly so; sheaths definitely longer than wide.
35. Plant rhizomatous; inflorescence simple. Ecuador.
V. (15a) espinosae, Phytologia 16: 163.
35. Plant not rhizomatous; inflorescence usually compound.
36. Floral bracts even, coriaceous. Bolivia, Paraguay, Argentina.....T. vernicosa
36. Floral bracts prominently nerved, thin.
37. Branches geniculate for the most part, spreading abruptly from the long erect sterile base.
38. Floral bracts distinctly and densely lepidote; spikes oblong or linear. Venezuela to Bolivia.
V. (67) heterandra
(including V. (68) lacera)
38. Floral bracts obscurely lepidote, appearing glabrous; spikes lanceolate. Mexico, West Indies, Venezuela, Colombia.....V. (69) didistichoides
37. Branches straight.
39. Inflorescence laxly pinnate. Peru.....T. gayi
39. Inflorescence digitate.
40. Scape little if any longer than the spikes. Nicaragua to Peru.....V. (64) chontalensis
40. Scape much longer than the spikes. Colombia.
V. (65) crenulipetala
32. Sepals 15-30 mm long.
41. Lowest spikes less than twice as long as the primary bracts (exclusive of blades); inflorescence bipinnate.
42. Inflorescence pendulous. Venezuela to Peru.
V. (10) tequendamae
42. Inflorescence erect.
43. Floral bracts carinate, 30-40 mm long. Peru.
V. (7) harmsiana
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43. Floral bracts nearly all convex and ecarinate, not over .
25 mm long.
44. Floral bracts coriaceous, even, soon glabrous. Colombia
to Peru.....V. (6) cylindrica
44. Floral bracts chartaceous, nerved, densely pale-
lepidote. Peru.
V. (6a) sagasteguii, Phytologia 16: 82.
41. Lowest spikes several times longer than the primary bracts
(exclusive of blades), or the inflorescence simple.
45. Inflorescence pinnate, the axis longer than the branches.
46. Floral bracts acute, even centrally. Mexico.
47. Leaf-blades appearing glabrous; floral bracts 2-3 times
as long as the internodes.....T. kirchhoffiana
47. Leaf-blades densely pale-lepidote beneath; floral bracts
4-5 times as long as the internodes.....T. parryi
46. Floral bracts obtuse, nerved or rugose; rhachis
prominently winged (excavated). Peru.
48. Spikes 15 mm wide; floral bracts 20 mm long, nerved.
T. extensa
48. Spikes 30 mm wide; floral bracts over 30 mm long,
strongly rugose-sulcate when dry.....T. ferreyrae
45. Inflorescence subpinnate or digitate, the axis shorter
than the branches or the inflorescence simple.
49. Sepals exerted above the floral bracts. Ecuador, Peru.
V. (1) hitchcockiana
49. Sepals covered by the floral bracts.
50. Leaf-blades green with scales obscure or lacking. Peru.
T. lindenii
50. Leaf-blades cinereous from a dense coat of scales.
51. Floral bracts over 3 times as long as the internodes,
glabrous.
52. Floral bracts 4-5 times as long as the internodes.
Colombia, Venezuela.....V. (4) robusta
52. Floral bracts 3-4 times as long as the internodes.
Ecuador, Peru.....V. (15) patula
51. Floral bracts only 2-3 times as long as the internodes.
53. Leaf-sheaths merging with the blades, castaneous only
near base; sepals 20-25 mm long. Peru.
V. (3) cereicola
53. Leaf-sheaths contracted at junction with blades,
almost wholly castaneous; sepals 15-20 mm long.
54. Floral bracts densely cinereous-lepidote.
Colombia, Peru.....V. (11) pereziana
54. Floral bracts glabrous to subdensely lepidote. Costa
Rica to Venezuela and Bolivia, Greater Antilles.
V. (3a) incurva, Phytologia 16: 458.

Subkey IV

1. Sepals shorter than the floral bracts and enfolded by them.
2. Floral bracts to 50 mm long. Colombia, Venezuela, Suriname,
Peru, Amazonian Brazil.....T. adpressiflora

2. Floral bracts not over 30 mm long.
3. Inflorescence simple; floral bracts glabrous. Ecuador.
T. acosta-solisii
3. Inflorescence compound.
4. Floral bracts red and glabrous except near apex. Peru.
V. (2) rauhi
4. Floral bracts completely covered with cinereous scales.
Mexico.....T. socialis
1. Sepals equaling or exceeding the floral bracts.
5. Leaves not over 7.5 cm long; sepals 9-15 mm long.
6. Floral bracts glabrous, 12 mm long. Argentina...T. peiranoi
6. Floral bracts densely lepidote.
7. Leaf-blades 3-5 mm wide; floral bracts 8 mm long. Peru,
Bolivia, Paraguay, Brazil, Argentina.....T. loliacea
7. Leaf-blades 15 mm wide; floral bracts 14 mm long. Peru.
T. aurea
5. Leaves 15-100 cm long; sepals 14-30 mm long.
8. Leaves covered with coarse cinereous spreading scales, 15-20
cm long; inflorescence few-branched. Mexico.
T. karwinskyana
8. Leaves covered with minute pale appressed or subappressed
scales, to 100 cm long.
9. Branches nearly or quite straight, slender, sterile for
about half their length from base. Hispaniola.
T. paniculata
9. Branches distinctly flexuous or geniculate.
10. Floral bracts even or at most faintly nerved near margin;
branches usually geniculate. Mexico to Honduras.
T. dasyliirifolia
10. Floral bracts prominently nerved throughout; branches
merely flexuous in most cases.
11. Sepals lepidote; leaf-scales subspreading. Jamaica.
T. calcicola
11. Sepals glabrous; leaf-scales closely appressed.
12. Rhachis slender; sepals 14-18 mm long. Georgia,
Florida, West Indies, Mexico, British Honduras,
Venezuela.....T. utriculata
12. Rhachis stout; sepals 25-30 mm long. Mexico, Central
America.....T. makoyana

Subkey V

1. Leaf-blades not more than 2 mm wide at base, filiform.
2. Inflorescence compound; sepals 7-8 mm long. Mexico, Central
America.....T. filifolia
2. Inflorescence simple; sepals to 14 mm long. Mexico,
Guatemala, Cuba, Jamaica.....T. argentea
1. Leaf-blades much more than 2 mm wide at base, definitely if
very narrowly triangular.
3. Leaf-scales produced on one side, spreading or subspreading,
making the leaf-blade wholly pruinose; sepals 10-18 mm
long.

4. Floral bracts ecarinate, slightly to much shorter than the sepals. Peru.
5. Inflorescence simple; floral bracts slightly shorter than the sepals.....T. aurea
5. Inflorescence compound; floral bracts much shorter than the sepals.
6. (Petal-blades purple when dry).....T. humilis
6. (Petal-blades yellow with brown spots; species otherwise indistinguishable; cf. case of T. funebris).
- T. aureo-brunnea
4. Floral bracts carinate toward apex, nearly equaling to exceeding the sepals; inflorescence usually compound.
7. Sepals more or less exerted. Peru.....T. purpurea
7. Sepals covered by the floral bracts.
8. Floral bracts nearly straight. Ecuador, Peru.
- T. straminea
8. Floral bracts strongly incurved. Peru.....T. cacticola
- 3, Leaf-scales not produced, symmetrical, appressed, wholly or partly covering the leaf-blade.
9. Flowers strongly deflexed-secund at anthesis; inflorescence amply and laxly compound (cf. Vriesea for other species).
10. Floral bracts about equaling the internodes, 20-25 mm long. Colombia, Ecuador.....T. mima
10. Floral bracts about twice as long as the internodes, 30-35 mm long. Ecuador.....T. secunda
9. Flowers not secund (sometimes appearing non-secund in Vriesea goniorachis with a simple inflorescence).
11. Internodes of the rhachis 20-30 mm long, about equaling the floral bracts; leaf-sheaths concolorous and merging gradually with the blades. Florida, West Indies, Panama, northern South America.....T. flexuosa
11. Internodes of the rhachis not more than 15 mm long.
- 12..Inflorescence compound.
13. Sepals not more than 13 mm long.
14. Flowers less than twice the internodes; inflorescence amply tripinnate. Bolivia.....T. marantoidea
14. Flowers more than twice the internodes; inflorescence bipinnate or at base slightly tripinnate. Ecuador, Peru.....T. oroyensis
13. Sepals 16-30 mm long; inflorescence not more than bipinnate.
15. Posterior sepals carinate, distinct from the anterior.
16. Floral bracts lepidote, equaling or exceeding the sepals. Honduras.....T. steiropoda
16. Floral bracts glabrous, distinctly exceeded by the sepals. Jamaica, Guadeloupe.....T. antillana
15. Posterior and anterior sepals ecarinate, similar.
17. Floral bracts 3 times as long as the internodes. Mexico.....T. parryi
17. Floral bracts not more than twice as long as the internodes. Brazil.....V. (12) lubbersii
12. Inflorescence simple.

18. Sepals 22-45 mm long.
 19. Posterior sepals carinate, distinct from the anterior.
 20. Sepals 22 mm long. Ecuador.....T. acosta-solisii
 20. Sepals 45 mm long. Ecuador.....T. pretiosa
 19. Posterior and anterior sepals ecarinate, similar.
 21. Rhachis 7 mm thick; sepals very broadly rounded,
 subtruncate. Brazil.....V. (73) goniorachis
 21. Rhachis much more slender.
 22. Leaf-blades green, obscurely lepidote. Brazil.
V. (13) triangularis
 22. Leaf-blades cinereous from a complete coat of coarse
 scales. Ecuador, Peru.....V. (15) patula
 18. Sepals not more than about 16 mm long.
 23. Floral bracts exceeding the sepals; flowers only
 divergent. Ecuador.....T. triglochinosides
 23. Floral bracts equaling or shorter than the sepals;
 flowers mostly spreading.
 24. Flowers divergent at anthesis; floral bracts ecarinate
 Ecuador.....T. cornuta
 24. Flowers spreading at anthesis.
 25. Rhachis alate (excavated). Central America,
 Trinidad, northern South America.....T. monadelpha
 25. Rhachis merely angled. Ecuador.
 26. Floral bracts only about twice as long as the
 slender internodes, barely carinate.
T. narthecioides
 26. Floral bracts about 4 times as long as the stout
 internodes, sharply carinate.....T. scaligera

Subkey VI

1. Sepals exerted above the floral bracts.
 2. Flowers erect; inflorescence simple...Panama, Trinidad.
T. subulifera
 2. Flowers spreading; inflorescence compound. Brazil...T. lima
 1. Sepals wholly covered by the floral bracts.
 3. Floral bracts densely cinereous-lepidote with coarse
 spreading or subspreading scales.
 4. Leaf-blades flat for most of their length, the outer ones
 spirally recurved; inflorescence pinnately compound.
 Mexico to Honduras, Jamaica.....T. streptophylla
 4. Leaf-blades involute-subulate throughout; inflorescence
 subpinnate to simple.
 5. Scape evident above the pseudo-bulb; inflorescence digitate
 or subpinnate from 3-6 spikes. Mexico, Guatemala.
T. seleriana
 5. Scape none above the pseudo-bulb; inflorescence simple or
 rarely of 2-3 spikes. Mexico, Florida and the West
 Indies to Ecuador and Brazil.....T. pruinosa
 3. Floral bracts closely appressed-lepidote or glabrous.
 6. Floral bracts carinate, acute, glabrous or glabrescent.

7. Leaf-sheaths broadly ovate to orbicular, forming a globose pseudo-bulb 2-4 cm long. Colombia to Peru....T. disticha
7. Leaf-sheaths ovate, 10 cm long, forming a narrowly ovoid pseudo-bulb. Mexico.....T. dressleri
6. Floral bracts ecarinate.
8. Floral bracts glabrous or obscurely lepidote.
9. Floral bracts even or nerved only near margin. Florida, West Indies and Mexico to Panama and Venezuela.
T. balbisiana
9. Floral bracts strongly nerved. Mexico to Costa Rica.
T. caput-medusae
8. Floral bracts densely lepidote.
10. Scape-bracts vaginiform, the upper merely apiculate; leaf blades straight or arched; sepals lepidote.
11. Posterior and anterior sepals all ecarinate, free, elliptic. Colombia, Peru, Bolivia, Brazil.
T. paraënsis
11. Posterior sepals carinate, short-connate, oblong. Dominican Republic.....T. ariza-juliae
10. Scape-bracts foliaceous; leaf-blades usually coiled or contorted.
12. Leaf-sheaths variegated. Mexico to Panama.....T. butzii
12. Leaf-sheaths green, concolorous or with only a narrow marginal band of red or purple.
13. Leaf-sheaths orbicular, abruptly contracted into the blades. West Indies and Mexico to Brazil and Colombia.....T. bulbosa
13. Leaf-sheaths ovate or elliptic, merging into the blades
14. Pseudo-bulb elongate, one-third to more than one-half the total length of the plant. Florida, West Indies and Mexico to Colombia.....T. circinnata
14. Pseudo-bulb relatively much smaller, only 2-5 cm long. Texas to Guatemala.....T. baileyi

Subkey VII

1. Posterior and anterior sepals convex, ecarinate, alike.
2. Leaf-blades green; floral bracts inflated, glaucous. Mexico.
T. mooreana
2. Leaf-blades cinereous.
3. Sepals 50 mm long. Ecuador.....T. spathacea
3. Sepals 15-27 mm long.
4. Floral bracts convex, ecarinate. Peru.
V. (6a) sagasteguii, Phytologia 16: 82.
4. Floral bracts carinate.
5. Inflorescence erect; spikes almost wholly covered by the primary bracts; floral bracts densely lepidote.
V. (8) tillandsioides
5. Inflorescence pendulous.
6. Floral bracts much exceeding the sepals, 40 mm long. Ecuador.....V. (9) arpcalyx
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6. floral bracts equaling or shorter than the sepals, 22 mm long. Venezuela to Peru.....V. (10) tequendamae
1. Posterior sepals carinate, distinct from the anterior.
7. Leaf-blades fine-subulate or setaceous.
8. Spikes lax. Venezuela, Brazil.....T. globosa
8. Spikes dense.
9. Leaf-blades tomentose-lepidote; inflorescence dense. Mexico.....T. plumosa
9. Leaf-blades appressed-lepidote; inflorescence lax.
10. Floral bracts densely appressed-lepidote at least when young, 8-14 (-19) mm long; (stamens exerted). South Carolina to Florida, West Indies and Mexico to Venezuela and northern Brazil.....T. setacea
10. Floral bracts sparsely lepidote, 10 mm long; (stamens included). Mexico, Guatemala, Salvador.....T. remota
7. Leaf-blades definitely if narrowly triangular.
11. Inflorescence appearing simple, short and dense with all of the 1-few-flowered spikes covered by the sheaths of the primary bracts.
12. Leaf-blades greenish with inconspicuous scales at least above.
13. Sheaths distinct; floral bracts and sepals glabrous. Mexico, Central America.....T. brachycaulos
13. Sheaths merging with the blades; floral bracts and sepals lepidote. Costa Rica.....T. abdita
12. Leaf-blades densely cinereous-lepidote on both sides.
14. Primary bracts subfoliaceous.
15. (Stamens exerted; petals blue). Mexico, Greater Antilles.....T. capitata
15. (Stamens included; petals whitish). Bolivia, Argentina. T. sphaerocephala
14. Primary bracts membranaceous.
16. Inflorescence fasciculate; primary bracts narrow. Mexico to Nicaragua.....T. ionantha
16. Inflorescence fusiform or ellipsoid; primary bracts ample. Mexico.
17. Primary bracts acute; (petals green)....T. benthamiana
17. Primary bracts obtuse or apiculate; (petals violet). T. andrieuxii
11. Inflorescence obviously compound, long or lax; upper spikes mostly exceeding the sheaths of the primary bracts.
18. Lower primary bracts merely acute or apiculate.
19. Leaf-blades equally cinereous-lepidote throughout. Ecuador, Peru.....T. latifolia
19. Leaf-blades green above, cinereous-lepidote beneath. Colombia.....T. dichrophylla
18. Lower primary bracts long-laminate.
20. Spikes all strict; inflorescence dense.
21. Scape very short or none; inflorescence sessile in the center of the rosette.
22. Leaf-sheaths ample, inflated. Mexico.....T. diguetii
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22. Leaf-sheaths narrow and indistinct, flat. Salvador. T. plagiotropica
21. Scape evident.
23. Inflorescence narrow, cylindric or fusiform.
24. Sepals 8-15 mm long.
25. Spikes dense; floral bracts exceeding the sepals.
Colombia.....T. engleriana
25. Spikes lax; floral bracts much shorter than the sepals.
Brazil.....V. (72) drepanocarpa
24. Sepals ca. 20-25 mm long.
26. Floral bracts convex, ecarinate. Hispaniola..T. hotteana
26. Floral bracts carinate. Mexico.
27. Spikes subterete especially toward apex, 6-flowered;
floral bracts glabrous (position here according to key
of Mez, Pflanzenreich p. 440, 441: "Spicae bracteis
primariis breviores vel eas vix superantes"; contra-
dicted in description, p. 482)....T. roland-gosselinii
27. Spikes complanate; floral bracts densely lepidote.
T. strobilifera
23. Inflorescence broad, ellipsoid to subglobose.
28. Floral bracts densely cinereous-lepidote. Colombia,
Trinidad, Venezuela, Brazil.....T. gardneri
28. Floral bracts glabrous or at apex slightly lepidote.
29. Sepals 7-9 mm long; inflorescence 4.5-7 cm long.
Venezuela, Colombia.....T. myriantha
29. Sepals 13-20 mm long.
30. Leaf-blades green, inconspicuously lepidote.
Dominican Republic.....T. moscosoi
30. Leaf-blades densely and conspicuously lepidote on both
sides.
31. Posterior sepals short-connate; (stamens exerted).
Mexico.....T. macrochlamys
31. Posterior sepals high-connate; (stamens included).
Colombia, Venezuela, Guiana.....T. turneri
20. Spikes at least in part divergent to spreading; inflorescence
lax at least at base.
32. Sepals 25-35 mm long.
33. Axis of the inflorescence slender; internodes sigmoid-
flexuous; spikes in about 2 ranks, all spreading.
34. Spikes 20 mm wide, strongly complanate. Honduras.
T. standleyi
34. Spikes 8 mm wide, slightly complanate. Mexico, Central
America.....T. orogenes
33. Axis of the inflorescence stout; internodes straight;
spikes in more than 2 ranks.
35. Spikes 3-5 cm wide, broadly ovate or elliptic. Mexico.
36. Floral bracts with flat sides, smooth; spikes much
compressed.....T. prodigiosa
36. Floral bracts with convex sides, wrinkled when dry;
spikes slightly compressed.....T. violacea
35. Spikes 2-3 cm wide, lance-oblong to elliptic.
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37. Floral bracts densely lepidote near apex. Colombia, Venezuela.....T. cuatrecasasii
37. Floral bracts glabrous. Peru.....T. wurdackii
- 32..Sepals 12-20 mm long.
38. Spikes lax, the rhachis wholly exposed.
39. Floral bracts much shorter than the sepals. Brazil.
T. geminiflora
39. Floral bracts equaling or exceeding the sepals.
40. Leaf-sheaths obscure, concolorous with the blades. Brazil.....T. brachyphylla
40. Leaf-sheaths ample, castaneous. Colombia.....T. archeri
38. Spikes dense or 1-flowered, the rhachis almost or wholly concealed.
41. Spikes 1-6-flowered.
42. Lower primary bracts with erect blades, flat, densely lepidote. Venezuela, Colombia.....T. turneri
42. Lower primary bracts with spreading or reflexed blades, enfolding the narrow spikes. Mexico.
43. Floral bracts 16-19 mm long.....T. foliosa
43. Floral bracts 13 mm long.....T. graebenerii
41. Spikes 10-15-flowered.
44. Spikes about twice as wide as long or less. Ecuador, Peru.....T. confertiflora
44. Spikes lanceolate, 2.5-3 times as long as broad.
45. Floral bracts even. Colombia.....T. caloura
45. Floral bracts nerved. Peru.
46. Inflorescence bipinnate.....T. interrupta
46. Inflorescence tripinnate.....T. pinnato-digitata

Subkey VIII

1. Sepals connate for more than half their length and forming a slender tube, ecarinate.....Guzmania spp.
1. Sepals not more than short-connate or only the posterior ones high-connate and these then carinate.
2. Leaf-blades tomentose-lepidote with narrowly lobed spreading scales, setaceous.
3. Sepals less than 12 mm long; scape well developed. Ecuador.
T. rupicola
3. Sepals 15-18 mm long; scape often very short or lacking.
4. Floral bracts 14-17 mm long; (petals yellowish green, 18 mm long; stamens included). Mexico.....T. plumosa
4. Floral bracts 25-35 mm long; (petals violet, 35-40 mm long; stamens exerted). Mexico to Honduras.....T. magnusiana
2. Leaf-blades not tomentose, the scales suborbicular and slightly if at all lobed.
5. Sepals maximally 25-35 mm long, lepidote. Mexico.
6. Sheaths dark castaneous, ample, contrasting with the blades.....T. oaxacana
6. Sheaths cinereous-lepidote, concolorous with the blades.
7. Sepals broadly oblanceolate, densely cinereous-lepidote; bracts caudate or acute.....T. macdougallii

7. Sepals lanceolate, sparsely lepidote.
8. Bracts acute; (petals green).....T. benthamiana
8. Bracts obtuse or apiculate; (petals violet)...T. andrieuxii
5. Sepals 9-20 mm long.
9. Sepals firm, coriaceous or subcoriaceous.
10. Scape short or none. Peru.....T. nana
10. Scape well developed.
11. Posterior sepals carinate and much connate. West Indies and Mexico to Venezuela and Bolivia.....T. juncea
11. Posterior and anterior sepals broadly convex, ecarinate. Peru, Bolivia, Brazil, Paraguay, Argentina...T. pohliana
9. Sepals membranaceous.
12. Scales of the leaf-blades asymmetric with subspreading basal lobes, coarse, cinereous.
13. (Stamens exerted; petals over 40 mm long). North America, northern South America.
14. Leaf-sheaths suborbicular, contracted to the long blades; plant usually long-caulescent and often branched. Mexico and the West Indies to Venezuela and Colombia.
T. schiedeana
14. Leaf-sheaths elliptic, merging with the short blades; plants stemless or rarely caulescent. Mexico to Nicaragua.....T. ionantha
13. (Stamens included; petals 18-20 mm long). Southern South America.
15. Sepals lepidote; leaves 9-12 cm long. Brazil, Paraguay, Argentina.....T. meridionalis
15. Sepals glabrous; leaves 3-4 cm long. Brazil.
T. sprengeliana
12. Scales of the leaf-blades symmetric, closely appressed or with equally raised margins.
16. Leaf-blades thin, flaccid, green, 10-20 mm wide; sheaths conspicuous.
17. Plant stemless or nearly so; posterior sepals carinate. Mexico, Central America.....T. brachycaulos
17. Plant caulescent; posterior and anterior sepals convex, ecarinate. Nicaragua to Ecuador..Guzmania angustifolia
16. Leaf-blades triangular or crescentiform in cross-section, mostly rigid, more or less cinereous, 5-13 mm wide; sheaths inconspicuous.
18. Lower floral bracts acute, not caudate; (petals yellow). Argentina.
19. Floral bracts broadly ovate or elliptic, stramineous; sepals posteriorly connate; (flowers odorless).
T. ixloides
19. Floral bracts ovate or lanceolate, roseate; sepals equally subfree; (flowers fragrant).....T. jucunda
18. Lower floral bracts rounded or attenuate, mostly setiform-caudate; (petals white or blue).
20. Scape very short, hidden by the leaves; leaves rigid, curved and often secund, attenuate but subpungent. Brazil.....T. rosea

20. Scape evident, well developed.
21. Lower floral bracts attenuate, then caudate; leaf-scales cup-shaped with an erect free margin; plant stemless or nearly so. Trinidad and Venezuela to Brazil and Argentina.....T. stricta
21. Lower floral bracts rounded and abruptly caudate; leaf-scales appressed in most cases; plant distinctly caulescent.
22. Leaf-blades slender (about 20 times as long as wide), or if robust then strongly secund.
23. Scape exceeding the leaves; (petals 28-30 mm long). Brazil.
24. Leaf-blades short, stout, strongly secund. T. araujei
24. Leaf-blades long, nearly straight, not notably secund.....T. nuptialis
23. Scape usually shorter than the slender leaves; (petals not over 20 mm long).
25. Sepals posteriorly connate. West Indies to Argentina.....T. tenuifolia
25. Sepals free. Brazil.....T. montana
22. Leaf-blades stouter (about 10 times as long as wide), scarcely if at all secund.
26. Floral bracts dark red; (petals dark blue). Brazil, Paraguay, Uruguay, Argentina.....T. aëranthos
26. Floral bracts pale rose to whitish; (petals dull blue to white). Argentina.....T. bergeri

Subkey IX

1. Posterior and anterior sepals all ecarinate and alike.
2. Floral bracts 45-55 mm long.
3. Inflorescence simple; plant 5-7 dm high. Ecuador, Peru, Bolivia.....T. walteri
3. Inflorescence amply compound; plants 1-2 m high.
4. Floral bracts coriaceous, nearly or quite even when dry. Mexico.....T. thyrsigera
4. Floral bracts fleshy, strongly rugose-sulcate in drying. Peru.....T. carnosa
2. Floral bracts 15-30 mm long.
5. Inflorescence simple.
6. Floral bracts even, dark-spotted; leaf-blades rounded and apiculate. Colombia.....T. excavata
6. Floral bracts nerved, concolorous; leaf-blades acute. Honduras.....T. glossophylla
5. Inflorescence compound.
7. Spikes pendent; floral bracts and sepals ecarinate, strongly nerved. Peru.....T. ecarinata
7. Spikes divergent to spreading.
8. Floral bracts narrowly elliptic, coriaceous, inflorescence usually amply tripinnate. Cuba, Jamaica, Central America.....T. excelsa

8. Floral bracts very broadly ovate, thin; inflorescence bipinnate. Ecuador.....T. hamaleana
1. Posterior sepals carinate.
9. Floral bracts all broadly convex and ecarinate, or a few faintly carinate.
10. Inflorescence simple; scapes numerous and axillary in each rosette. West Indies and Costa Rica to Guyana and Bolivia.....T. complanata
10. Inflorescence compound, solitary, central.
11. Floral bracts nearly or quite even.
12. Spikes substrict; floral bracts to 35 mm long. Mexico to Honduras.....T. lucida
12. Spikes nutant; floral bracts 15-20 mm long. Venezuela to Peru.....T. denudata
11. Floral bracts strongly nerved or rugose-sulcate at least when dry.
13. Floral bracts 22-50 mm long, rugose-sulcate when dry.
14. Floral bracts narrow, exposing the rhachis. Bolivia, Argentina.....T. maxima
14. Floral bracts broad, wholly covering the rhachis. Peru.
T. rauhi
13. Floral bracts 10-20 mm long, evenly nerved, not rugose.
15. Lower primary bracts exceeding the sterile bases of the branches.
16. Spikes terete; inflorescence pendent. Peru....T. teres
16. Spikes complanate; inflorescence erect.
17. Sepals 9-10 mm long; lower branches usually divided. Mexico, Central America.....T. guatemalensis
17. Sepals 12-13 mm long; lower branches usually simple. Greater Antilles.....T. selleana
15. Lower primary bracts shorter than the sterile bases of the branches.
18. Floral bracts 12 mm long. Venezuela to Peru.
T. tovarensis
18. Floral bracts 17-20 mm long.
19. Flowers barely imbricate. Peru.....T. platyphylla
19. Flowers densely imbricate. Bolivia.....T. boliviana
9. Floral bracts distinctly carinate.
20. Floral bracts strongly and regularly nerved, thin.
21. Inflorescence simple. Colombia.
V. (38a) dubia, Phytologia 15: 197.
21. Inflorescence compound.
22. Leaf-sheaths pale, merging with the blades.
23. Lower primary bracts with large foliaceous blades; spikes long-stipitate; floral bracts to 43 mm long. Mexico.....T. deppeana
23. Lower primary bracts acute or apiculate, bladeless.
24. Inflorescence densely digitate; leaf-blades broadly rounded. Peru.....T. brevilingua
24. Inflorescence elongate.
25. Inflorescence tripinnate; leaves acute to acuminate. Venezuela.....T. duidae

25. Inflorescence bipinnate; leaves broadly acute or rounded and apiculate. Ecuador, Peru.
Vriesea (83a) zamorensis
 (L. B. Smith) L. B. Smith, comb. nov. Tillandsia
zamorensis L. B. Smith, Phytologia 4: 213. 1953.
22. Leaf-sheaths dark, contrasting with the blades.
26. Inflorescence laxly and amply tripinnate; plant over 2 m.
 Bolivia.....T. krukoffiana
26. Inflorescence bipinnate or subtripinnate and narrow.
27. Primary bracts barely exceeding the short sterile bases of the branches; floral bracts strongly incurved. Peru
T. wagneriana
27. Primary bracts covering half of each of the lower branches at least.
28. Inflorescence interrupted below; spikes 8-12-flowered.
 Ecuador, Peru, Bolivia.....T. rubella
28. Inflorescence densely fusiform; spikes 5-flowered.
 Colombia.....T. fusiformis
20. Floral bracts even or nearly so.
29. Inflorescence laxly compound at least at base; spikes or branches divergent to nutant.
30. Spikes nutant or reflexed.
31. Spikes subsessile, straight, subovate. Ecuador.
T. superba
31. Spikes long-stipitate, curved, narrow.
32. Floral bracts lance-oblong; spikes 12-flowered. Peru.
T. somnians
32. Floral bracts broad, ovate or obovate.
33. Floral bracts dark castaneous with pale margins, 15-20 mm long. Colombia, Ecuador.....T. denudata
33. Floral bracts pale, concolorous. Ecuador.
34. Sepals 28-30 mm long.....T. clavigera
34. Sepals 20 mm long.....T. brevicapsula
30. Spikes not more than spreading.
35. Floral bracts beaked, acuminate, 27-45 mm long.
36. Spikes caudate-acuminate from a 3-5 cm broad base; floral bracts 27-35 mm long. Ecuador, Peru.....T. stenoura
36. Spikes lance-ovate, acute, 6 cm wide; floral bracts 40-45 mm long. Colombia.....T. sigmoidea
35. Floral bracts acute to rounded and apiculate but not beaked.
37. Leaf-blades marked with dark irregular cross-bands. Peru
T. roezlii
37. Leaf-blades not banded.
38. Leaf-blades densely and conspicuously cinereous-lepidote (at least beneath).
39. Leaf-blades almost as strongly lepidote above as beneath. Peru.....T. subconcolor
39. Leaf-blades glabrous above, the sides strongly contrasting.
40. Floral bracts to 34 mm long; posterior sepals very short-connate. Peru.....T. wurdackii

40. Floral bracts 17-22 mm long; posterior sepals much connate. Colombia to Peru.....T. confinis
38. Leaf-blades green.
41. Sepals distinctly more connate posteriorly than anteriorly
42. Inflorescence subdigitate. Colombia.....T. reversa
42. Inflorescence elongate.
43. Spikes strongly complanate; floral bracts with flat sides. Colombia to Peru.....T. pyramidata
43. Spikes stout; floral bracts with convex sides. Peru.
T. macrodactylon
41. Sepals free or equally very short-connate.
44. Spikes less than 3 times as long as wide, broadly ovate. Colombia.....T. lajensis
44. Spikes narrow, more than 3 times as long as wide.
45. Floral bracts oblong, 25 mm long; plant glaucous. Peru.
T. glauca
45. Floral bracts obovate, to 45 mm long; plant not glaucous. West Indies to Venezuela and Bolivia.
T. fendleri
29. Inflorescence simple or densely compound with strict spikes.
46. Floral bracts long-attenuate, 110-130 mm long; inflorescence simple. Costa Rica, Colombia.
V. (36a) monstrum, Phytologia 16: 81.
46. Floral bracts shorter and broader.
47. Inflorescences several, lateral, simple; scape-bracts 2-ranked, much smaller than the floral bracts. Mexico, Central America.....T. multicaulis
47. Inflorescence solitary, central, often compound.
48. Leaf-blades densely pale-lepidote beneath.
49. Blades broadly rounded and apiculate. Colombia.
T. fassettii
49. Blades attenuate. Bolivia.....T. kuntzeana
48. Leaf-blades green.
50. Leaf-apices broad; primary bracts at least half as long as the spikes. Ecuador.....T. aequatorialis
50. Leaf-apices acute or acuminate; primary bracts short or the inflorescence simple.
51. Inflorescence amply tripinnate; floral bracts 17 mm long, castaneous with buff margins. Colombia.
T. acuminata
51. Inflorescence bipinnate or simple.
52. Floral bracts 50 mm long. Mexico.....T. heterophylla
52. Floral bracts not over 30 mm long (including T. fendleri var. reducta keyed here).
53. Sepals free. Colombia, Ecuador.....T. fendleri
53. Sepals connate posteriorly.
54. Floral bracts orange, drying pale. Colombia.
T. reversa
54. Floral bracts dark, drying nearly black. Peru.
T. lopezii
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Subkey X

1. Lower floral bracts less than twice the internodes; spike-rhachis slender.
2. Rhachis straight; inflorescence bipinnate. Colombia.
T. rariflora
2. Rhachis geniculate; inflorescence tripinnate. Peru.
T. hutchisonii
1. Lower floral bracts more than twice the internodes.
3. Flowers downwardly secund. Ecuador.....T. cucullata
3. Flowers not secund.
4. Posterior sepals carinate.
5. Floral bracts not over 11 mm long, thin, nerved; leaf-sheaths very dark; blades broadly acute or rounded.
6. Inflorescence tripinnate; leaf-blades 30-40 mm wide.
7. Floral bracts much shorter than the sepals. Ecuador.
T. pinnata
7. Floral bracts about equaling the sepals. Colombia.
T. delicatula
6. Inflorescence bipinnate.
8. Floral bracts much shorter than the sepals; leaf-blades 20-25 mm wide. Costa Rica, Panama.....T. singularis
8. Floral bracts equaling the sepals; leaf-blades to 70 mm wide. Ecuador.....T. truncata
5. Floral bracts 15-40 mm long.
9. Floral bracts carinate.
10. Floral bracts even; inflorescence bipinnate. Colombia.
T. carrierei
10. Floral bracts nerved.
11. Inflorescence subdensely bipinnate. Ecuador. Cf. 2 pages above, line 3.....V. (83a) zamorensis
11. Inflorescence laxly tripinnate.
12. Primary bracts at most barely exceeding the long sterile bases of the pinnately divided branches. Peru.....T. maculata
12. Primary bracts much exceeding the short sterile bases of the subdigitately divided branches. Venezuela.
T. duidae
9. Floral bracts broadly convex, ecarinate.
13. Flowers densely imbricate; floral bracts rugose-sulcate when dry. Bolivia, Argentina.....T. maxima
13. Flowers barely imbricate; floral bracts evenly nerved, not rugose. Peru.....T. platyphylla
4. Posterior and anterior sepals convex, ecarinate.
14. Floral bracts carinate, incurved. Ecuador.
15. Floral bracts 30-34 mm long, much exceeding the sepals; leaf-blades 20 mm wide.....T. dyeriana
15. Floral bracts 12-21 mm long, about equaling the sepals; leaf-blades 30-45 mm wide.
16. Floral bracts imbricate at anthesis and covering much of the rhachis.....T. hamaleana
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16. Floral bracts inrolled about the flowers at anthesis and wholly exposing the rhachis.....T. nubis
14. Floral bracts convex, ecarinate, straight toward apex or nearly so.
17. Rhachis broadly alate; sepals much exceeding the floral bracts.
18. Floral bracts 20-30 mm long. Colombia to Peru.
T. platyrhachis
18. Floral bracts 7 mm long. Bolivia.....T. laxissima
17. Rhachis scarcely if at all alate.
19. Floral bracts 30-55 mm long, coriaceous, even or nearly so. Mexico.
20. Floral bracts much exceeding the sepals; scape-bracts foliaceous.....T. thyrsigera
20. Floral bracts from nearly equaling the sepals to much shorter.
21. Inflorescence much branched; plant to 2 m high.
T. grandis
21. Inflorescence simple or few-branched....T. viridiflora
19. Floral bracts less than 20 mm long, thin, nerved.
22. Flowers barely twice as long as the internodes; rhachis very slender, geniculate. Peru.....T. hutchisonii
22. Flowers much more than twice as long as the internodes.
23. Leaf-sheaths pale and spotted, concolorous with the blades. Costa Rica.....T. venusta
23. Leaf-sheaths very dark overlaid with a pale gray coat of scales. Ecuador.....T. asplundii

Subkey XI

1. Floral bracts strongly and regularly nerved.
2. Floral bracts broadly ovate or elliptic; sepals mostly exerted.
3. Upper scape-bracts broadly rounded and apiculate. Lesser Antilles, Venezuela..V. (76a) cowellii, Phytologia 16: 80.
3. Upper scape-bracts acute, foliaceous.
4. Spikes 1-3-flowered; leaves 20 cm long; blades 20 mm wide. Costa Rica to Venezuela and Bolivia.....T. biflora
4. Spikes (at least the lowest) more than 3-flowered; leaves 20-50 cm long; blades 20-50 mm wide. Ecuador, Peru, Bolivia.....T. ionochroma
2. Floral bracts narrower and equaling or exceeding the sepals.
5. Sepals 16-20 mm long.
6. Inflorescence densely fusiform; spikes all strict. Colombia.....T. fusiformis
6. Inflorescence lax at least at base with the lower spikes more or less spreading. Mexico, Central America.
T. leiboldiana
5. Sepals 8-10 mm long.
7. Plant to 8 dm high. Central America.....T. guatemalensis
7. Plant 2.5-5 dm high. Honduras.....T. uyucensis
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1. Floral bracts even or nearly so, equaling or exceeding the sepals.
8. Spikes (or some of them) divergent to spreading or recurving or the lower remote.
9. Spikes digitate, 6-9-flowered; sepals subfree, 21 mm long.
Colombia, Ecuador.....T. schimperiana
9. Spikes pinnate; axis of the inflorescence elongate.
10. Sepals maximally 21-30 mm long.
11. Spikes 4-6-flowered. North America.
12. Inflorescence erect, dense toward apex. Mexico to Honduras.....T. yunckeri
12. Inflorescence pendent, very lax. Guatemala...T. deflexa
11. Spikes 7-12-flowered. Andean South America.
13. Leaf-apex rounded and caudate.
14. Inflorescence pendent. Colombia, Ecuador...T. brunonis
14. Inflorescence erect. Ecuador.....T. emergens
13. Leaf-apex acuminate.
15. Leaf-blades densely cinereous-lepidote beneath. Peru.
T. wurdackii
15. Leaf-blades glabrous. Ecuador.....T. fosteri
10. Sepals maximally 13-20 mm long.
16. Inflorescence tripinnate at least at base. North America.
17. Inflorescence pyramidal. Central America, Cuba, Jamaica.....T. excelsa
17. Inflorescence slenderly thyrsoid. Costa Rica.
T. werckleana
16. Inflorescence not more than bipinnate. Andean South America.
18. Sepals free; spikes spreading.
19. Spikes 8-14-flowered. Colombia, Ecuador.....T. buseri
19. Spikes 4-6-flowered. Ecuador.....T. sceptriformis
18. Sepals connate posteriorly.
20. Leaf-blade rounded-apiculate; spikes 5-10-flowered.
Greater Antilles, Venezuela.....T. compacta
20. Leaf-blade acute; spikes 4-flowered. Colombia or Ecuador (?).....T. humboldtii
8. Spikes all strict; inflorescence all dense.
21. Spikes to 20-flowered. Ecuador.
22. Inflorescence erect; sepals high-connate posteriorly.
T. polyantha
22. Inflorescence pendent; sepals free.....T. demissa
21. Spikes not more than 8-flowered.
23. Sepals 30 mm or longer, free. Mexico, Salvador.
T. imperialis
23. Sepals 8-25 mm long.
24. Floral bracts about half as long as the sepals; spikes 3-flowered, long-stipitate. Colombia, Venezuela.
T. stipitata
24. Floral bracts about equaling or exceeding the sepals.
25. Spikes 1-2-flowered; primary bracts all foliaceous.
Costa Rica.....T. cauliflora

25. Spikes 4-8-flowered; upper primary bracts not foliaceous.
 26. Leaf-blades conspicuously cinereous-lepidote beneath.
 Colombia.....T. orbicularis
 26. Leaf-blades obscurely lepidote beneath.
 27. Sepals high-connate posteriorly, 20-25 mm long.
 28. Leaf-blades acute or acuminate; sheaths dark purple.
 Colombia.....T. ultima
 28. Leaf-blades rounded and long-caudate; sheaths pale, con-
 colorous with the blades. Ecuador.....T. aequatorialis
 27. Sepals equally subfree or the posterior very short-connate
 29. Sepals 8-18 mm long.
 30. Floral bracts rounded. Bolivia.....T. violascens
 30. Floral bracts acute. Colombia, Ecuador.....T. pastensis
 29. Sepals 25 mm long. Ecuador.
 31. Inflorescence pendulous; floral bracts incurved but
 not cucullate.....T. sodiroi
 31. Inflorescence erect; floral bracts cucullate.
 T. pachyaxon

Subkey XII

1. Inflorescence simple or subdigitate from a few spikes; floral
 bracts ample, as long as the sepals or usually twice as
 long, usually membranaceous.
 2. Leaf-blades straight or nearly so.
 3. Floral bracts lax, not concealing the rhachis; inflorescence
 pendulous. Colombia.....T. trapeziformis
 3. Floral bracts imbricate and concealing the rhachis; inflo-
 rescence erect or nearly so. Colombia to Bolivia.
 T. seemannii
 2. Leaf-blades distinctly undulate-cripsed. Panama to Peru.
 T. crispa
 1. Inflorescence ample, pinnately paniced or the floral bracts
 shorter than the sepals.
 4. Flowers remaining distichous, not at all secund.
 5. Flowers strictly erect, closely appressed to the rhachis,
 remote; floral bracts mostly equaling or shorter than the
 internodes.
 6. Leaf-blade ligulate. Venezuela, Colombia.....T. tenuispica
 6. Leaf-blades narrowly triangular. Ecuador, Peru.
 T. pugiformis
 5. Flowers more or less divergent or dense.
 7. Floral bracts about equaling the sepals or distinctly
 longer.
 8. Floral bracts over 10 mm long.
 9. Primary bracts exceeding the spikes; floral bracts
 exceeding the flowers, membranaceous. Ecuador.
 T. gilmartinae
 9. Primary bracts much shorter than the branches.
 10. Floral bracts even, coriaceous.
 11. Branches arcuate-spreading; floral bracts subspread-
 ing, not at all imbricate. Mexico..T. ghiesbreghtii

11. Branches erect or ascending; floral bracts erect, densely imbricate. Mexico, Honduras.....T. adscendens
10. Floral bracts more or less nerved, thin.
12. Inflorescence very amply and laxly tripinnate. Ecuador.
T. elegans
12. Inflorescence bipinnate, the spikes subdense.
13. Leaf-blades ligulate, to 7 cm wide, thin. Ecuador.
T. inconspicua
13. Leaf-blades narrowly subtriangular, 2-3 cm wide, subcoriaceous.....T. riocreuxii
8. Floral bracts less than 10 mm long.
14. Floral bracts even or faintly few-nerved margin, without a midnerve.
15. Floral bracts almost exactly equaling the sepals, not conspicuously incurved at apex.
16. Inflorescence pendent at maturity. West Indies, Venezuela.....T. lescaillei
16. Inflorescence erect.
17. Branches all turned to one side; leaf-blades ligulate, usually narrow. Venezuela.....T. stenoglossa
17. Branches pointing in all directions. Costa Rica to Bolivia and Brazil.....T. spiculosa
15. Floral bracts definitely exceeding the sepals.
18. Floral bracts not at all incurved at apex; flowers suberect.
19. Spikes dense, strict; floral bracts concealing the rhachis with their very broad bases. Central America.
T. rothschuhiana
19. Spikes lax; floral bracts not at all concealing the rhachis. Jamaica.....T. fawcettii
18. Floral bracts definitely incurved at apex; flowers spreading.
20. Leaf-blades lanceolate; inflorescence bipinnate. Ecuador.....T. homostachya
20. Leaf-blades ligulate; inflorescence tripinnate. Ecuador, Bolivia.....T. monticola
14. Floral bracts nerved, thin.
21. Leaf-blades ligulate.
22. Spikes subdense; flowers mostly contiguous. Ecuador.
T. quadripinnata
22. Spikes very lax; flowers not contiguous. Peru.
T. diffusa
21. Leaf-blades narrowly triangular.
23. Primary bracts erect; branches arching-pendulous. Ecuador to Bolivia.....T. pendulispica
23. Primary bracts spreading; branches not arching-pendulous.
24. Flowers spreading; spikes oblong. Colombia..T. subalata
24. Flowers erect; spikes linear. Ecuador.....T. sinuosa
7. Floral bracts all or nearly all distinctly shorter than the sepals.
25. Leaf-blades ligulate or subligulate, mostly abruptly acute or rounded.

26. Floral bracts and sepals densely ferruginous-lepidote.
Ecuador.....T. tripinnata
26. Floral bracts and sepals white-lepidote to glabrous.
27. Inflorescence bipinnate.
28. Branches all turned to one side; leaf-blades usually narrow; scape-bracts mostly remote. Venezuela.
T. stenoglossa
28. Branches pointing in all directions; scape-bracts imbricate. Colombia.....T. membranacifolia
27. Inflorescence tripinnate.
29. Sepals acute, nerved, the posterior ones strongly keeled.
30. Leaf-blades rounded-apiculate. Galapagos Islands of Ecuador.....T. insularis
30. Leaf-blades attenuate. Ecuador, Peru.....T. multiflora
29. Sepals rounded to truncate; leaf-blades 30-50 mm wide.
31. Leaf-blades attenuate. Peru.....T. pallidoflavens
31. Leaf-blades with broad apiculate apices.
32. Branches arching-pendulous; scape-bracts much shorter than the internodes. Colombia.....T. michelii
32. Branches spreading; scape-bracts about equaling the internodes. Bolivia.....T. pardina
25. Leaf-blades narrowly triangular or linear, attenuate.
33. Floral bracts and sepals densely ferruginous-lepidote.
34. Sepals and floral bracts cuspidate; spikes strict; inflorescence slenderly cylindric. Peru.....T. cuspidata
34. Sepals and floral bracts not more than apiculate.
35. Rhachis geniculate, quadrangular; inflorescence subdensely tripinnate. Ecuador.....T. tripinnata
35. Rhachis flexuous, subterete.
36. Sepals 4-5 mm long.
37. Primary bracts small and inconspicuous; inflorescence amply and laxly tripinnate. Peru, Bolivia...T. bakeri
37. Primary bracts at least half as long as the axillary branches; inflorescence bipinnate. Costa Rica to Bolivia.....T. adpressa
36. Sepals 6-9 mm long.
38. Spikes 3-5- (rarely more -) flowered, distinctly stipitate. Greater Antilles, Venezuela....T. caribaea
38. Spikes about 10-flowered, subsessile. Venezuela to Peru
T. tetrantha
33. Floral bracts and sepals pale-lepidote to glabrous.
39. Sepals acute. Ecuador, Peru.....T. multiflora
39. Sepals rounded or subtruncate.
40. Spikes dense.
41. Scape-bracts acuminate or apiculate; inflorescence bipinnate. Nicaragua to Panama.....T. contorta
41. Scape-bracts with fine linear contorted blades; inflorescence 4-pinnate. Colombia, Ecuador.
T. penlandii
40. Spikes lax.
42. Branches spreading, straight. West Indies, Venezuela, Guayana.....T. jermanii

42. Branches divergent or curved-ascending.
43. Inflorescence amply tripinnate, to 50 cm long; leaf-blades to 30 mm wide.
44. Scape-bracts exceeding the internodes. Peru.
T. pallidoflavens
44. Scape-bracts remote. Colombia, Ecuador.
T. ropalocarpa
43. Inflorescence bipinnate or tripinnate only at base.
45. Leaf-sheaths with large purple spots; scape strongly curved. Brazil.....T. aeris-incola
45. Leaf-sheaths not spotted.
46. Blades about as long as the sheaths; flowers all about twice as long as the internodes. Colombia.
T. sanctae-martae
46. Blades much longer than the sheaths; flowers usually much shorter than the lower internodes.
47. Leaf-blades linear, about 5 mm wide. Peru, Bolivia.
T. parviflora
47. Leaf-blades distinctly triangular, to 18 mm wide.
Peru.....T. commixa
4. Flowers turning secund.
48. Flowers all turned upwards.
49. Inflorescence ferruginous-lepidote, bipinnate or rarely subtripinnate. Venezuela, Colombia, Ecuador, Peru.
T. tetrantha
49. Inflorescence sparsely white-lepidote; amply tripinnate. Colombia, Ecuador, Peru.....T. fraseri
48. Flowers all turned downwards.
50. Scape-bracts foliaceous-laminate; leaf-blades narrowly triangular.
51. Sepals 10 mm long; bract-blades straight. Peru.
T. laminata
51. Sepals 5 mm long; bract-blades contorted. Colombia, Ecuador.....T. penlandii
50. Scape-bracts not more than apiculate; leaf-blades ligulate.
52. Floral bracts turning secund with the flowers. Colombia.
T. pectinatá
52. Floral bracts remaining distichous. Colombia, Ecuador.
T. riocreuxii

Supplement to Key

- II - 83a. Leaf-sheaths ferruginous; blades evenly lepidote on
(90a) both sides; (stamens exerted).....T. fasciculata
83a. Leaf-sheaths dark castaneous; blades somewhat less
(90a) densely lepidote above; (stamens included). Peru.
T. subconcolor
- II - 87a. Spikes linear-lanceolate, 15-20 mm wide.....T. confinis
87a. Spikes lance-oblong, 30 mm wide. Costa Rica.
T. oerstediana
-

III - 36a. Floral bracts lepidote at apex only; spikes erect.

36a. Floral bracts densely cinereous-lepidote; spikes spreading. Peru. T. vernicosa

V. (67a) appenii, Brom. Soc. Bull. 19: 111.

TILLANDSIA

Relative to Mez in Engler, Pflanzenreich IV. Fam. 32. 1935.
(Synonymy in separate list following)

ABDITA L. B. Smith, Phytologia 8: 10. 1961. TIL?

ACHYROSTACHYS E. Morr. ex Baker; Pflr. 494. TIL.

Var. ACHYROSTACHYS. Floral bracts ample, completely covering the rhachis.

Var. STENOLEPIS L. B. Smith, Contr. U. S. Nat. Herb. 29: 505. 1951. Floral bracts narrow, not altogether concealing the rhachis, not over 3 cm long.

ACOSTAE Mez & Tonduz; Pflr. 466. TIL.

ACOSTA-SOLISII Gilmartin, Phytologia 16: 160. 1968. PHY.

ACUMINATA L. B. Smith, Contr. U. S. Nat. Herb. 29: 434. 1951. ALL?

ADPRESSA André; Pflr. 512. PS-C.

Var. ADPRESSA. Inflorescence 15-20 cm long, often decurved; primary bracts shorter to longer than the spikes; spikes erect, lax.

Var. ORTHIANTHA (Standley) L. B. Smith, Contr. Gray Herb. 89: 9. 1930. Inflorescence 6-12 cm long, erect; primary bracts covering most or all of each spike; spikes erect, dense.

Var. TONDUZIANA (Mez) L. B. Smith, Contr. Gray Herb. 89: 8. 1930. Inflorescence erect or decurved; spikes spreading to reflexed at maturity, laxly flowered.

ADPRESSIFLORA Mez; Pflr. 459. ALL.

ADSCENDENS L. B. Smith, North Am. Fl. 19: 122. 1938. PS-C.

AEQUATORIALIS L. B. Smith, Phytologia 6: 258. 1958. ALL?

AERANTHOS (Loisel.) L. B. Smith, Lilloa 9: 200. 1943. ANO.

AERIS-INCOLA (Mez) Mez; Pflr. 514. PS-C.

AIZOIDES Mez; Pflr. 588. DIA.

ALBERTIANA Verveorst, Brom. Soc. Bull. 19: 128. 1969. ANO.

ALBIDA Mez & Purpus; Pflr. 459. TIL.

AMPLA Mez & Sodiro; Pflr. 534. ALL.

ANCEPS Lodd.; Pflr. 573. PHY.

ANDICOLA Gillies ex Baker; Pflr. 590. DIA.

ANDREANA E. Morr. ex André; Pflr. 496. TIL.

ANDRIEUXII (Mez) L. B. Smith, Contr. Gray Herb. 117: 31. 1937. TIL.

ANGULOSA Mez; Pflr. 589. DIA.

ANTILLANA L. B. Smith, Contr. U. S. Nat. Herb. 29: 282. 1949. ALL.

ARAUJEI Mez; Pflr. 563. ANO.

ARCHERI L. B. Smith, Proc. Am. Acad. 68 (Contr. Gray Herb. 102): 147. 1933. ALL.

.....

- ARCUANS L. B. Smith, Contr. U. S. Nat. Herb. 29: 436. 1951. ALL.
- Var. ARCUANS. Floral bracts to 55 mm long, 33 mm wide; rhachis-internodes 5 mm long.
- Var. NAUNDORFFII Gilmartin, Phytologia 16: 158. 1968. Floral bracts 38-40 mm long, 23 mm wide; rhachis-internodes 9 mm long.
- ARENICOLA L. B. Smith, Phytologia 16: 77. 1968. ALL?
- AREQUITAE André ex Mez; Pflr. 558. ANO.
- ARGENTEA Griseb.; Pflr. 463. TIL.
- ARGENTINA C. H. Wright, Kew Bull. "1907": 60. 1907; A. Hunziker, Trab. Mus. Bot. Univ. Cordoba 2: 299. 1960. ANO.
- ARHIZA Mez; Pflr. 580. PHY.
- ARIZA-JULIAE L. B. Smith & Jiménez, Phytologia 6: 433. 1959. TIL.
- ASPLUNDII L. B. Smith, Phytologia 6: 441. 1959. ALL.
- AUREA Mez; Pflr. 585. PHY.
- AUREO-BRUNNEA Mez; Pflr. 570. PHY.
- BAILEYI Rose ex Small; Pflr. 492. TIL.
- BALBISIANA Schult. f.; Pflr. 475. TIL.
- BALLOPHYLLA Harms, Notizblatt 12: 538. 1935; L. B. Smith, Bromel. Soc. Bull. 15: 4. 1965. PSA.
- BANDENSIS Baker; Pflr. 584. PHY.
- BARBEYANA Wittm.; Pflr. 505. ALL.
- BARTRAMII Ell.; L. B. Smith, Phytologia 13: 454. 1966. TIL.
- BENTHAMIANA Kl. ex Baker; Pflr. 498. TIL.
- BERGERI Mez; Pflr. 566. ANO.
- BIFLORA R. & P.; Pflr. 548. ALL.
- BOLIVIANA Mez; Pflr. 522. ALL.
- BOLIVIENSIS Baker; Pflr. 528. ALL?
- BOURGAEI Baker; Pflr. 481. TIL.
- BRACHYCAULOS Schlecht.; Pflr. 478. TIL.
- Var. BRACHYCAULOS. Plant slender. Spikes 1-2-flowered.
- Var. MULTIFLORA L. B. Smith, Contr. Gray Herb. 154: 35. 1945. Plant stout. Spikes to 4-flowered.
- BRACHYPHYLLA Baker; Pflr. 569. ANO.
- BREVICAPSULA Gilmartin, Phytologia 16: 156. 1968. ALL?
- BREVILINGUA Mez ex Harms; Pflr. 535. ALL.
- BREVIOR L. B. Smith, Contr. U. S. Nat. Herb. 29: 436. 1951. TIL? VRIESEA?
- BRUNONIS André, Pflr. 544. ALL?
- BRYOIDES Griseb. ex Baker, emend. L. B. Smith, Proc. Am. Acad. 70 (Contr. Gray Herb. 106): 192. 1935. DIA.
- BULBOSA Hook. Pflr. 491. TIL.
- BUSERI Mez, Pflr. 542. ALL.
- Var. BUSERI. Sepals subfree, to 6 mm wide.
- Var. NUBICOLA Gilmartin, Phytologia 16: 158. 1968. Sepals posteriorly connate for 4-6 mm, to 8 mm wide.
- BUTZII Mez; Pflr. 636. TIL.
- CACTICOLA L. B. Smith, Contr. U. S. Nat. Herb. 29: 534. 1954. PHY.
- CAERULEA H. B. K.; Pflr. 586. PHY.
- CALCICOLA L. B. Smith & Proctor, Phytologia 16: 77. 1968. TIL.

CALOCEPHALA Wittm.; Pflr. 567. ALL.

CALOTHYRSUS Mez; Pflr. 473. TIL.

CALOURA Harms, Pflr. 543. ALL?

CANESCENS Sw.; Pflr. 486. TIL.

CAPILLARIS R. & P.; Pflr. 593. DIA.

Forma CAPILLARIS. Leaves linear. Scape elongate, pseudo-axillary. Floral bracts with 5 or more nerves, glabrous or subglabrous.

Forma INCANA (Gillies ex Baker) L. B. Smith, Proc. Am. Acad. 70 (Contr. Gray Herb. 106): 211. 1935. Leaves short and stout, mucronate, appressed and ascending so that they form an almost continuous plane.

Forma CORDOBENSIS (Hieron.) L. B. Smith, l. c. Leaves slender widely spaced so that the greater part of each sheath is uncovered. Scapes usually terminal. Floral bracts densely and persistently lepidote.

Forma VIRESCENS (R. & P.) L. B. Smith, op. c. 212. Scapes never elongating much after anthesis, mostly shorter than the leaves.

Forma HIERONYMII (Mez) L. B. Smith, op. c. 213. Floral bracts with only 3 strong nerves meeting near the apex, other nerves if any, short and with free apices.

CAPITATA Griseb.; Pflr. 477. TIL.

Var. CAPITATA. Sepals glabrous or nearly so.

Var. GUZMANIOIDES L. B. Smith, Contr. Gray Herb. 127: 18. 1939
Sepals densely lepidote.

CAPUT-MEDUSAE E. Morr.; Pflr. 488. TIL.

CARDENASII L. B. Smith, Proc. Am. Acad. 70 (Contr. Gray Herb. 106): 154. 1935. ALL.

CARIBAEA L. B. Smith, Proc. Am. Acad. 70 (Contr. Gray Herb. 106): 155. 1935. PS-C.

CARLSONIAE L. B. Smith, Phytologia 7: 1. 1959. TIL.

CARNOSEA L. B. Smith, Phytologia 9: 251. 1963. TIL.

CARRIEREI André; Pflr. 534. ALL?

CASTELLANII L. B. Smith, Contr. Gray Herb. 104: 80. 1934. DIA

CAULESCENS Brongn. ex Baker; Pflr. 555. ALL.

CAULIFLORA Mez & Wercklé; Pflr. 549. ALL.

CAULIGERA Mez; Pflr. 555. ALL.

CERNUA L. B. Smith, Phytologia 5: 401. 1956. ALL.

CERATEANA L. B. Smith, Phytologia 5: 398. 1956. ALL.

CHAETOPHYLLA Mez; Pflr. 494. ALL?

CHARTACEA L. B. Smith, Contr. U. S. Nat. Herb. 29: 437. 1951.
ALL.

Var. CHARTACEA. Floral bracts dense. Sepals 22 mm long.

Var. PERUVIANA L. B. Smith, Phytologia 4: 218. 1953. Floral bracts subdense and partly exposing the rhachis. Sepals 16 mm long.

CHLOROPHYLLA L. B. Smith, North Am. Fl. 19: 145..1938. TIL.

CIRCINNATA Schlecht.; Pflr. 492. TIL.

CLAVIGERA Mez; Pflr. 533. ALL.

COMMIXA Mez; Pflr. 510. PS-C.

COMPACTA Griseb.; Pflr. 547. ALL.

- Var. COMPACTA. Floral bracts 18-23 mm long. Sepals 14-16 mm long.
- Var. INTERMEDIA L. B. Smith, Phytologia 7: 3. 1959. Floral bracts 35 mm long. Sepals 18 mm long.
- COMPLANATA Benth.; Pflr. 552. ALL.
- CONCOLOR L. B. Smith, Phytologia 7: 249. 1960. TIL.
- CONFERTIFLORA André; Pflr. 542. ALL.
- CONFINIS L. B. Smith, Phytologia 4: 218. 1953. ALL.
- CONTORTA Mez & Pittier; Pflr. 514. PS-C.
- CORNUTA Mez & Sodiro; Pflr. 572. PHY?
- CRISPA (Baker) Mez; Pflr. 499. PS-C.
- CROCATA (E. Morr.) Baker; Pflr. 585. PHY.
- CRYPTOPODA L. B. Smith, Ceiba 1: 229. 1951. TIL.
- CUATRECASASII L. B. Smith, Phytologia 5: 36. 1954. ALL.
- CUCULLATA L. B. Smith, Phytologia 6: 193. 1958. ALL.
- CUSPIDATA L. B. Smith, Phytologia 9: 252. 1963. PS-C.
- CYANEA Linden ex K. Koch; L. B. Smith, Contr. U. S. Nat. Herb. 29: 489. 1951. PHY.
- Var. CYANEA. Scape short. Spikes elliptic. Petal-blades wholly deep violet.
- Var. TRICOLOR (André) L. B. Smith, op. c. 491. Spike broadly oblong, many-flowered. Petal-blade blue with a white eye at base
- Var. ELATIOR L. B. Smith, Phytologia 5: 181. 1955. Scape to 29 cm high.
- DASYLIRIIFOLIA Baker; Pflr. 462. TIL.
- DEFLEXA L. B. Smith, Contr. Gray Herb. 154: 35. 1945. TIL?
- DELICATULA L. B. Smith, Phytologia 5: 36. 1954. ALL.
- DEMISSA L. B. Smith, Contr. U. S. Nat. Herb. 29: 527. 1954. ALL.
- DENUDATA André; Pflr. 534. ALL.
- DEPPEANA Steud.; L. B. Smith, Bromel. Soc. Bull. 15: 4. 1965. ALL.
- DIAGUITENSIS Castellanos; Pflr. 558. ANO.
- DICHOPHYLLA L. B. Smith, Phytologia 5: 283. 1955. ALL.
- DIDISTICHA (E. Morr.) Baker; Pflr. 529. ANO.
- DIFFUSA L. B. Smith, Phytologia 9: 252. 1963. PS-C.
- DIGUETII Mez & Rol.-Goss.; Pflr. 476. TIL?
- DISTICHA H. B. K.; Pflr. 525. ALL.
- DRESSLERI L. B. Smith, Phytologia 8: 221. 1962. ALL.
- DUGESII Baker; Pflr. 472. TIL.
- DUIDAE L. B. Smith; Pflr. 518. ALL.
- DURA Baker; Pflr. 555. ALL.
- DURATII Vis.; Pflr. 579. PHY.
- Var. DURATII. Inflorescence largely bipinnate; spikes strict. Floral bracts densely and persistently lepidote.
- Var. CONFUSA (Hassler) L. B. Smith, Phytologia 16: 78. 1968. Inflorescence 2-3-pinnate; spikes curved-spreading. Floral bracts densely and persistently lepidote.
- Var. SAXATILIS (Hassler) L. B. Smith, l. c. Inflorescence 2-3-pinnate; spikes curved-spreading. Floral bracts glabrous or subglabrous.
- DYERIANA André; Pflr. 576. PHY.

ECARINATA L. B. Smith, sp. nov. A T. carnosa L. B. Smith, cui verisimilliter affinis, omnibus partibus bene minoribus, spicis valde laxioribus differt.

PLANT flowering to 1.5 m high. LEAVES very many in a dense rosette, ca 6 dm long, covered with appressed brown-centered scales; sheaths broadly elliptic, 2 dm long, dark castaneous; blades ligulate, acuminate, 8 cm wide, yellow-green in spite of the scales. SCAPE erect, stout; scape-bracts subfoliaceous, densely imbricate. INFLORESCENCE erect but with pendent spikes, very laxly tripinnate, glabrous; primary bracts subtriangular, shorter than the sterile bracteate bases of the branches; axes pale carmine red (! Rauh), glaucous; spikes linear, 20-30 cm long 23 mm wide, strongly complanate, subdensely many-flowered; rhachis flexuous, narrowly alate. FLORAL BRACTS suberect, slightly more than twice the internodes but narrow and largely exposing the rhachis, oblong, broadly acute, 23 mm long, ecarinate, strongly nerved, red; flowers subsessile. SEPALS elliptic, obtuse, 23 mm long, slightly exerted, ecarinate, strongly nerved; petals blue-violet, the blades elliptic, 8 mm long; stamens slightly exerted, greenish. CAPSULE fusiform. Pl. I, fig. 1: Plant x 1/20; fig. 2: Floral bract and fruit x 1; Sepal x 1.

PERU: AMAZONAS: On steep rocks, near Bagua Grande, 700 m alt, Sep 1967, Rauh RP - 20390 (US, type); on Cactaceae, Pongo de Rentema, Prov. Bagua, 300 m alt, 25 May 1963, López, Sagástegui & Collantes 4152 (TRP, US).

EHRENBERGIANA Kl. ex Baker; L. B. Smith, Proc. Am. Acad. 70 (Contr. Gray Herb.): 175, 176. 1935. TIL.

ELEGANS L. B. Smith, Contr. U. S. Nat. Herb. 29: 528. 1954. PS-C.

ELONGATA H. B. K.; Pflr. 525. ALL.

Var. ELONGATA. Spikes to 4 dm long and 40-flowered.

Var. SUBIMBRICATA (Baker) L. B. Smith, Journ. Washington Acad. Sci. 43: 68. 1953. Spikes only about 2 dm long and 20-flowered.

EMERGENS Mez & Sodiro; Pflr. 542. ALL?

ENGLERIANA Wittm.; Pflr. 541. ALL?

ERECTA Gill. ex Baker; Pflr. 588. DIA.

ESSERIANA Rauh & L. B. Smith, sp. nov. A T. diaguitense Castellanos, cui affinis, caule brevi, bracteis florigeris dense imbricatis, petalorum laminis amplissimis differt.

PLANT short-caulescent to nearly stemless, the flowering shoot shorter than the leaves. LEAVES polystichous, to 50 cm long; sheaths indistinct, ca 5 cm long, brown; blades narrowly triangular, arching-recurved, 25 mm wide at base, covered with closely appressed cinereous scales. SCAPE erect, to 15 cm long; scape-bracts vaginiform, tightly imbricate, green. INFLORESCENCE of 1-3 spikes; spikes fusiform, slightly complanate, 10-17 cm long. FLORAL BRACTS densely imbricate and completely covering the rhachis, elliptic, very broadly acute, 45 mm long, 15 mm wide, broadly convex, ecarinate or the midnerve slightly thickened near apex, green, covered with pale inconspicuous appressed scales; flowers subsessile. SEPALS lanceolate, acute, 27 mm long, free, ecarinate, thin, nerved, sparsely pale-lepidote; petals with

linear white claws 45 mm long, the blades spreading, broadly ovate, rounded, 20-25 mm long, undulate on the margins, bright violet; stamens shorter than the petal-claws but exceeding the pistil; style slender, more than twice as long as the ovary. Pl. I, fig. 4: Plant x 1/5; fig. 5: Sepal x 1.

PARAGUAY: AMAMBAY: On steep rocks of the Cerro Guazú and Cerro Corá, Esser s. n., cult. W. Rauh ES-14853 (US, type).

EXCAVATA L. B. Smith, Caldasia 3: 243. 1945. ALL? VRIESEA?

EXCELSA Griseb.; Pflr. 520. ALL.

EXSERTA Fernald; Pflr. 476. TIL.

EXTENSA Mez; Pflr. 461. TIL.

FASCICULATA Sw.; Pflr. 467. TIL.

Var. FASCICULATA (latispica); Pflr. 467.

Var. CONVEXISPICA Mez; l. c.

Var. PENDULISPICA Mez; op. c. 468.

Var. VENOSISPICA Mez; l. c.

Var. CLAVISPICA Mez; l. c.

Var. DENSISPICA Mez; l. c.

Var. LAXISPICA Mez; l. c.

Var. UNCISPICA Mez; l. c.

Var. ROTUNDATA L. B. Smith, Contr. Gray Herb. 154: 36. 1945.

Inflorescence globose; primary bracts suborbicular, apiculate; spikes ovate, complanate, 4-6 cm long. Floral bracts cucullate, more or less rugose when dry.

Var. FLORIDANA L. B. Smith, Phytologia 15: 197. 1967. Inflorescence of several small spikes as in var. densispica Mez.

Floral bracts thin-coriaceous, lepidote.

FASSETTII L. B. Smith, Phytologia 5: 284. 1955. ALL.

FAWCETTII Mez, Pflr. 509. PS-C.

FENDLERI Griseb.; L. B. Smith, Bromel. Soc. Bull. 15: 4. 1965. ALL.

Var. FENDLERI. Inflorescence bipinnate or subtripinnate, elongate, lax.

Var. REDUCTA (L. B. Smith) L. B. Smith, Mem. N. Y. Bot. Gard. 14, pt. 3: 48. 1967. Inflorescence simple or digitate from a few spikes.

Var. NERVISEPALA Gilmartin, Phytologia 16: 157. 1968. Floral bracts 27 mm long. Sepals 20 mm long, nerved.

FERREYRAE L. B. Smith, Publ. Mus. Hist. Nat. "Javier Prado" Univ. Nac. Mayor San Marcos ser. B. no. 16: 5. 1964. TIL?

FERRISIANA L. B. Smith, Bromel. Soc. Bull. 10: 92. 1960. TIL?

FESTUCOIDES Brongn. ex Mez; Pflr. 466. TIL.

FILIFOLIA Schlecht. & Cham.; Pflr. 463. TIL.

FLABELLATA Baker; Pflr. 484. TIL.

Var. FLABELLATA. Leaves red, to 35 cm long.

Var. VIRIDIFOLIA M. B. Foster, Bromel. Soc. Bull. 7: 70. 1957. Leaves green, smaller.

FLAGELLATA L. B. Smith, Phytologia 6: 258. 1958. ALL?

FLEXUOSA Sw.; L. B. Smith, North Am. Fl. 19: 129. 1938. TIL.

FLORIBUNDA H. B. K.; Pflr. 465. ALL.

FOLIOSA Martens & Galeotti; L. B. Smith, North Am. Fl. 19: 151. 1938. TIL.

FOSTERI Gilmartin, Phytologia 16: 157. 1968. ALL?

FRASERI Baker; Pflr. 516. PS-C.

FRIESII Mez; Pflr. 556. ANO.

FUNEBRIS Castellanos; Pflr. 588. DIA.

FUSIFORMIS L. B. Smith, Contr. U. S. Nat. Herb. 29: 438. 1951.
ALL.

GARDNERI Lindl.: Pflr. 568. ANO.

GAYI Baker; Pflr. 537. ALL.

GEISSEI Phil.: Pflr. 559. ANO.

GEMINIFLORA Brongn.; Pflr. 569. ANO.

Var. GEMINIFLORA. Leaf-scales closely appressed.

Var. INCANA (Wawra) Mez; Pflr. 569. Leaf-scales spreading.

GHIESBREGHTII Baker; Pflr. 505. PS-C.

GILLIESII Baker; Pflr. 589. DIA.

GILMARTINIAE L. B. Smith, Phytologia 9: 247. 1963. PS-C.

GLAUCA L. B. Smith, sp. nov. A *T. fendleri* Griseb., cui verisimiliter affinis, planta omnino glauca, bracteis floribusque subduplo minoribus differt.

PLANT stemless, flowering 1.2 m high, glaucous. LEAVES few, suberect, 40-50 cm long; sheaths large but narrow and concolorous with the blades beneath; blades ligulate, acuminate, 6-8 cm wide, green. SCAPE erect, exceeding the leaves; scape-bracts imbricate, the lowest subfoliaceous, the others ovate, acuminate. INFLORESCENCE pyramidal, laxly tripinnate; primary bracts ovate, acuminate, exceeding the sterile bracteate bases of the branches; branches spreading; spikes lance-oblong, 9 cm long, 15 mm wide, strongly complanate. FLORAL BRACTS imbricate and nearly or quite concealing the rhachis at anthesis, elliptic, broadly acute, 20-25 mm long, coriaceous, even, thick-carinate toward apex; flowers subsessile. SEPALS free, elliptic, acute, 23 mm long, coriaceous, faintly nerved, the posterior carinate; petals 35 mm long, blue; stamens included. Pl. I, fig. 6: Branch x 1/2; fig. 7: Sepal x 1.

PERU: PIURA: Near Ayabaca, 1700-2000 m alt, Rauh 20033 (US, type).

GLOBOSA Wawra; Pflr. 569. ANO.

Var. GLOBOSA. Inflorescence not more than bipinnate; spikes 2-3-flowered.

Var. MAJOR L. B. Smith, Arq. Bot. Est. S. Paulo II. 1: 114. 1943. Inflorescence tripinnate; some spikes 4-flowered.

GLOSSOPHYLLA L. B. Smith, Field Mus. Publ. Bot. 17: 319. 1938.
ALL.

GRAEBENERII Mez; Pflr. 477. TIL.

GRANDIS Schlecht.; Pflr. 455. PSA.

GUATEMALENSIS L. B. Smith, Contr. U. S. Nat. Herb. 29: 281. 1949. ALL.

GYMNOBOTRYA Baker; Pflr. 518. ALL.

HAMALEANA E. Morr.; Pflr. 575. PHY.

HETEROMORPHA Mez; Pflr. 531. ANO?

HETEROPHYLLA E. Morr.; L. B. Smith, North Am. Fl. 19: 111. 1938. PSA.

HOMOSTACHYA André; Pflr. 507. PS-C.

- HOTTEANA Urb.; Pflr. 547. ALL.
HUMBOLDTII Baker; Pflr. 546. ALL?
HUMILIS Presl; Pflr. 570. PHY.
HUTCHISONII L. B. Smith, Phytologia 13: 145. 1966. ALL.
IGNESIAE Mez; Pflr. 494. ALL.
IMPERIALIS E. Morr.; Pflr. 482. TIL.
INCARNATA H. B. K.; Pflr. 554. ALL.
INCONSPICUA André; Pflr. 505. PS-C.
INDIGOFERA Mez & Sodiro; Pflr. 518. ALL.
INSIGNIS (E. Morr.) L. B. Smith & Pittendrigh, Journ. Washington Acad. Sci. 43: 402. 1953. ALL.
INSULARIS Mez; Pflr. 511. PS-C.
Var. INSULARIS. Leaf-blades 25-40 mm wide; sheaths usually concolorous with the blades, without purple coloring. Spikes ascending to recurving. Floral bracts glabrous, usually shorter than the sepals. Capsule to 23 mm long.
Var. LATILAMINA Gilmartin, Phytologia 16: 163. 1968. Leaf-blades wider; sheaths purple. Spikes ascending. Floral bracts lepidote, sometimes slightly exceeding the sepals.
INTERRUPTA Mez; Pflr. 544. ALL.
INTUMESCENS L. B. Smith, Phytologia 5: 177. 1955. TIL.
IONANTHA Planch.; L. B. Smith, Lilloa 6: 384. 1941. TIL.
Var. IONANTHA. Plant stemless. Scape lacking.
Var. SCAPOSA L. B. Smith, Lilloa 6: 384. 1941. Plant stemless. Scape short, but distinct.
Var. VANHYNINGII M. B. Foster, Bromel. Soc. Bull. 7: 71. 1957. Plant caulescent. Scape lacking.
IONOCHROMA André ex Mez; Pflr. 548. ALL.
IXIOIDES Griseb.; Pflr. 559. ANO.
Var. IXIOIDES. Plant flowering 16 cm or slightly higher. Leaves about 10 cm long.
Var. OCCIDENTALIS Castellanos, An. Mus. Nac. Hist. Nat. Buenos Aires 37: 504. 1933. Plant flowering 30 cm and higher. Leaves 13-18 cm long.
JENMANII Baker; Pflr. 514. PS-C.
JUCUNDA Castellanos, An. Mus. Nac. Hist. Nat. Buenos Aires 36: 56. 1929. ANO.
JUNCEA (R. & P.) Poir.; Pflr. 465. TIL.
KARWINSKYANA Schult. f.; Pflr. 459. TIL.
KEGELIANA Mez; Pflr. 493. TIL.
KIRCHHOFFIANA Wittm.; Pflr. 473. TIL.
KRUKOFFIANA L. B. Smith, Contr. Gray Herb. 154: 36. 1945. ALL
KUNTZEANA Mez; Pflr. 540. ALL?
LAJENSIS André; Pflr. 535. ALL.
LAMINATA L. B. Smith, Phytologia 9: 253. 1963. PS-C.
LAMPPODA L. B. Smith, Field Mus. Publ. Bot. 17: 320. 1938. TIL.
Var. LAMPPODA. Plant flowering 4-5 dm high. Leaves to 5 dm long. Inflorescence simple.
Var. MAJOR L. B. Smith, Phytologia 10: 483. 1964. Plant flowering over 6 dm high. Leaves ca 8 dm long. Inflorescence digitate from 3 spikes.

LANDBECKII Phil.; Pflr. 591. DIA.

LATIFOLIA Meyen; Pflr. 539. ALL.

Var. LATIFOLIA (Pflr. 539).

Var. MAJOR Mez; Pflr. l. c.

Var. DIVARICATA (Benth.) Mez; Pflr. l. c.

LAXISSIMA Mez; Pflr. 577. PHY?

LEIBOLDIANA Schlecht.: Pflr. 551. ALL.

Var. LEIBOLDIANA. Leaves concolorous.

Var. GUTTATA M. H. Hobbs, Bromel. Soc. Bull. 11: 43. 1961.

Leaves red-spotted at base.

LEPIDOSEPALA L. B. Smith, Proc. Am. Acad. 70 (Contr. Gray Herb. 106): 155. 1935. TIL?

LESCAILLEI C. Wright in Sauvalle; Pflr. 514. PS-C.

LEUCOLEPIS L. B. Smith, Phytologia 8: 497. 1963. TIL.

LIMAE L. B. Smith, sp. nov. A T. subulifera Mez, cui verisimiliter affinis, inflorescentia ramosa, spicis laxis, floribus patentibus differt.

PLANT stemless, flowering 25-30 cm high with inflorescence extended. LEAVES 20-30 in an ovoid pseudobulb, erect, the inner ones to 20 cm long, the outer greatly reduced, appressed-cinereous-lepidote, concolorous; sheaths ovate, about as long as the blades; blades narrowly triangular, abruptly acute or obtuse, involute. SCAPE curved, 2 mm in diameter; scape-bracts erect, ovate, shorter than the internodes. INFLORESCENCE bipinnate from 3 or 4 spikes, lax, 9-11 cm long, glabrous (?); primary bracts like the scape-bracts, shorter than the sterile naked or 1-bracteate bases of the branches; spikes subspreading, 4-8.5 cm long, laxly 2-9-flowered; rhachis slender, geniculate. FLORAL BRACTS broadly ovate, about half as long as the sepals, strongly nerved; flowers spreading, subsessile. SEPALS elliptic, 14 mm long, nerved, ecarinate. CAPSULE cylindric, beaked, 25 mm long. Pl. I, fig. 8: Plant x 1/4; fig. 9: Sepal x 1.

BRAZIL: MATO GROSSO: On trunk of buritirana palm, bank of Rio Tuatuari (affluent of Rio Kuluene), 12° 12' S, 53° 22' W, 12 May 1958, A. Lima 58-3144 (IPA type, US photo)

LINDENII Regel; L. B. Smith, Contr. U. S. Nat. Herv. 29: 491. 1951. PHY.

Var. LINDENII. Scape solitary, terminal. Spike lanceolate, acute.

Var. DUVALIANA L. B. Smith, nom. nov. T. lindenii E. Morr.

(non Regel) var. duvalii Duval ex André, Rev. Hort. 71: 516.

1899, nom. illeg. T. lindenii Regel var. duvalii L. B. Smith, Contr. U. S. Nat. Herb. 29: 493. 1951, nom. illeg. Scape solitary, terminal. Spike elliptic, obtuse.

Var. ABUNDANS L. B. Smith, nom. nov. T. lindenii E. Morr.

(non Regel) var. luxurians E. Morr. Belg. Hort. 21: 289. 1871,

nom. illeg. T. lindenii Regel var. luxurians L. B. Smith, Contr. U. S. Nat. Herb. 29: 494. 1951, nom. illeg. Scapes several, terminal and axillary. Flowers single.

Var. KOUTSINSKYANA (E. Morr.) L. B. Smith, Contr. U. S. Nat.

Herb. 29: 494. 1951. Phytarrhiza lindenii E. Morr. (non Tillandsia lindenii Regel) var. koutsinskyana E. Morr. Belg. Hort. 30:

80. 1880. Scapes several, terminal and axillary. Flowers more or less doubled, to 8 cm in diameter.

LINEARIS Vell.; Pflr. 585. ANO. (style too long for subgenus Phytarrhiza).

LINEATISPICA Mez; Pflr. 473. TIL.

LOLIACEA Mart. ex Schult. f.; Pflr. 586. DIA.

LONGIFOLIA Baker; Pflr. 520. ALL.

LOPEZII L. B. Smith, Phytologia 8: 502. 1963. ALL.

LORENTZIANA Griseb.; Pflr. 529. ANO. Including forma simplex Kuntze, Pflr. 530.

LUCIDA E. Morr. ex Baker; Pflr. 470. ALL.

MACBRIDEANA L. B. Smith; Pflr. 556. ANO.

MACDOUGALLII L. B. Smith, Contr. U. S. Nat. Herb. 29: 277.

1949. TIL.

MACROCHLAMYS Baker; Pflr. 477. TIL.

MACRODACTYLON Mez; Pflr. 536. ALL. I once considered this a synonym of the species now known as T. fendleri Griseb. because both supposedly had free sepals. Recently Dr. Edith Raadts has examined the type of T. macrodactylon and reports that in reality it has the posterior sepals distinctly connate.

MACULATA R. & P.; Pflr. 522. ALL.

MAGNUSIANA Wittm.; Pflr. 497; L. B. Smith, Phytologia 19: 287. 1970. TIL.

MAKOYANA Baker; Pflr. 460. TIL.

MALLEMONTII Glaziou ex Mez; Pflr. 584. PHY.

MARANTOIDEA Rusby; Pflr. 519. ALL.

MATUDAE L. B. Smith, Contr. U. S. Nat. Herb. 29: 278. 1949.

ALL.

MAURYANA L. B. Smith, Contr. Gray Herb. 117: 31. 1937. ALL.

MAXIMA Lillo & Hauman; Pflr. 518. ALL.

Var. MAXIMA. Plant flowering 1.5 m high. Leaf-blades 10 cm wide. Spikes rather lax, 10 cm long. Floral bracts 22-40 mm long. Sepals 22-30 mm long.

Var. DENSIOR L. B. Smith, Lilloa 14: 97. 1948. Plant flowering 8-10 dm high. Leaf-blades 6-8 cm wide. Spikes very dense, 14-19 cm long. Floral bracts to 3 cm long. Sepals 22 mm long.

MEMBRANACIFOLIA L. B. Smith; Pflr. 505. PS-C.

MERIDIONALIS Baker; Pflr. 561. ANO.

MEXIAE L. B. Smith, Contr. Gray Herb. 117: 32. 1937. TIL?

MEXICANA L. B. Smith, North Am. Fl. 19: 140. 1938. TIL?

MICANS L. B. Smith, Phytologia 5: 402. 1956. ALL.

MICHELII Mez; Pflr. 510. PS-C.

MIMA L. B. Smith, Caldasia 3: 244. 1945. TIL.

MONADELPHA (E. Morr.) Baker; Pflr. 571. PHY.

MONTANA Reitz, Sellowia no. 14: 106. 1962. ANO.

MONTICOLA Mez & Sodiro; Pflr. 507. PS-C.

MOOREANA L. B. Smith, nom. nov. T. inflata Mez in DC. Mon. Phan. 9: 701. 1896, non Baker, 1886; Pflr. 457. TIL. The new specific name is in honor of Harold E. Moore, Jr., to whom I am indebted for beautiful material of this and many other species.

MOSCOSOI L. B. Smith, Phytologia 5: 281. 1955. TIL.

MULTICAULIS Steud.; L. B. Smith, North Am. Fl. 19: 130. 1938.

TIL.

MULTIFLORA Benth.; Pflr. 509. PS-C.

Var. MULTIFLORA. Leaf-blades narrowly triangular, caudate-attenuate. Scape-bracts much exceeding the internodes. Primary bracts exceeding the lower axillary branches.

Var. DECIPIENS (André) L. B. Smith, Contr. Gray Herb. 89: 13. 1930. Leaf-blades and scape-bracts as in the typical variety. Primary bracts all shorter than the axillary branches.

Var. TOMENSIS L. B. Smith; Pflr. 509. Leaf-blades linear-lanceolate, acute or acuminate. Scape-bracts equaling or slightly exceeding the internodes. Primary bracts broadly lanceolate, apiculate, much shorter than the axillary branches.

MYOSURA Griseb. ex Baker; L. B. Smith, Proc. Am. Acad. 70 (Contr. Gray Herb. 106): 199. 1935. DIA.

MYRIANTHA Baker; Pflr. 549. ALL.

NANA Baker; Pflr. 567. ANO.

NARTHECIOIDES Presl; Pflr. 571. PHY.

NUBIS Gilmartin, Phytologia 16: 161. 1968. PHY.

NUPTIALIS Ruby Braga & D. Sucre, Loeffgrenia no. 35: 1. 1969.

ANO.

OAXACANA L. B. Smith, Contr. U. S. Nat. Herb. 29: 279. 1949.

TIL.

OERSTEDIANA L. B. Smith, Phytologia 13: 141. 1966. ALL?

ORBICULARIS L. B. Smith, Phytologia 5: 38. 1954. ALL?

OROGENES Standley & Williams, Ceiba 3: 188. 1953. ALL.

OROYENSIS Mez; Pflr. 537. ALL.

ORTGIESIANA E. Morr. ex Mez; Pflr. 466. TIL.

PACHYAXON L. B. Smith, Phytologia 6: 259. 1958. ALL?

PALEACEA Presl; L. B. Smith, Contr. Gray Herb. 104: 81. 1934.

PHY.

PALLIDOFLAVENS Mez; Pflr. 511. PS-C.

PANICULATA L.; Ariza-Julia, Bromel. Soc. Bull. 9: 3. 1959; Howard, *ibid.* 9: 54. 1959. PSA.

PARAENSIS Mez; Pflr. 490. TIL.

PARDINA L. B. Smith, Lilloa 14: 98. 1948. PS-C.

PARRYI Baker; Pflr. 474. TIL.

PARVIFLORA R. & P.; Pflr. 513. PS-C.

PASTENSIS André; Pflr. 543. ALL?

PECTINATA André; Pflr. 516. PS-C.

PEIRANOI Castellanos, Lilloa 2: 14. 1938. PHY.

PENDULISPICA Mez; Pflr. 503. PS-C.

PENLANDII L. B. Smith, Lilloa 6: 384. 1941. PS-C.

Var. PENLANDII. Primary bracts equaling or exceeding the sterile bases of the branches. Floral bracts broadly ovate, obtuse, slightly shorter than the sepals.

Var. PEDUNCULATA L. B. Smith, Lilloa 6: 385. 1941. Primary bracts shorter than the long sterile bases of the branches. Floral bracts triangular, acute, much shorter than the sepals.

*petraea L. B. Smith, Contr. U. S. Nat. Herb. 29: 497. 1951. VRIESEA PETRAEA (L. B. Smith) L. B. Smith, comb. nov. Fresh cultivated material arriving from Alfred Blass after the completion of my key shows appendaged petals and necessitates the transfer

of this species to Vriesea.

- PINNATA Mez & Sodiro; Pflr. 519. ALL?
 PINNATO-DIGITATA Mez; Pflr. 541. ALL.
 PIURENSIS L. B. Smith, Phytologia 13: 146. 1966. ALL?
 PLAGIOTROPICA Rohweder, Senckenbergiana 34: 112. 1953. TIL?
 PLATYPHYLLA Mez; Pflr. 522. ALL.
 PLATYRHACHIS Mez; Pflr. 576. PHY.
 PLUMOSA Baker; Pflr. 497. ALL.
 POHLIANA Mez; L. B. Smith, Smithsonian Misc. Coll. 126: 84.
 1955. ANO.
 POLITA L. B. Smith, Lilloa 6: 385. 1941. TIL.
 POLYANTHA Mez & Sodiro; Pflr. 481. ALL?
 POLYSTACHIA (L.) L.; Pflr. 475. TIL.
 PONDEROSA L. B. Smith, Contr. Gray Herb. 154: 37. 1945. TIL.
 PRETIOSA Mez; Pflr. 575. PHY?
 PRODIGIOSA (Lem.) Baker; Pflr. 481. TIL.
 PRUINOSA Sw.; Pflr. 493. TIL.
 PUEBLENSIS L. B. Smith; Pflr. 494. TIL.
 Var. PUEBLENSIS. Floral bracts appressed-gray-lepidote.
 Var. GLABRIOR L. B. Smith, Phytologia 6: 257. 1958. Floral
 bracts soon glabrous.
 PUGIFORMIS L. B. Smith; Pflr. 515. PS-C.
 PUNCTULATA Schlecht. & Cham.; Pflr. 470. TIL.
 PURPUREA R. & P.; Pflr. 532. PHY.
 PYRAMIDATA André; Pflr. 536. ALL?
 QUADRIPINNATA Mez & Sodiro; Pflr. 508. PS-C.
 QUEROENSIS Gilmartin, Phytologia 16: 159. 1968. ALL.
 RACINAE L. B. Smith, Contr. U. S. Nat. Herb. 29: 439. 1951.
 ALL?
 RARIFLORA André; Pflr. 524. ALL?
 RAUHII L. B. Smith, Bromel. Soc. Bull. 8: 44. 1958. TIL.
 RECTANGULA Baker; Pflr. 588. DIA.
 RECURVATA (L.) L.; Pflr. 591. DIA.
 Var. RECURVATA. (Pflr. 591).
 Var. CILLATA E. Morr. ex Mez; Pflr. 592.
 Var. CONTORTA André; Pflr. 592.
 Var. MINUTA Mez; Pflr. 592.
 REDUCTA L. B. Smith, Phytologia 5: 399. 1956. ALL.
 REICHENBACHII Baker; L. B. Smith, Proc. Am. Acad. 70 (Contr.
 Gray Herb. 106): 155. 1935. PHY.
 REMOTA Wittm.; Pflr. 464; L. B. Smith, Phytologia 8: 10. 1961.
 ALL.
 RESTREPOANA André; Pflr. 542. ALL.
 RETORTA Griseb. ex Baker, Pflr. 589. DIA.
 RETIGIANA Mez; Pflr. 472. TIL.
 REVERSA L. B. Smith, Phytologia 5: 40. 1954. ALL?
 RHOMBOIDEA André; Pflr. 554. ALL.
 RIOCREUXII André; Pflr. 516. PS-C.
 RODRIGUEZIANA Mez; Pflr. 474. TIL.
 ROEZZII E. Morr.; Pflr. 537. ALL.
 ROLAND-GOSSELINII Mez; Pflr. 482. TIL?
 ROMEROI L. B. Smith, Phytologia 8: 499. 1963. ALL.

- ROPALOCARPA André; Pflr. 511. PS-C.
 ROSEA Lindl.; L. B. Smith, Smithsonian Misc. Coll. 126: 81.
 1955. ANO.
- ROTHSCHUHLIANA Mez; Pflr. 504. PS-C.
 RUBELLA Baker; Pflr. 536. ALL.
 RUPICOLA Baker; Pflr. 560. PHY?
 RUSBYI Baker; L. B. Smith, Rhodora 71: 244. 1969. ALL.
 SAGASTEGUII L. B. Smith, Phytologia 8: 503. 1963. ALL.
 SANCTAE-MARTAE L. B. Smith, Phytologia 5: 396. 1956. PS-C.
 SCALIGERA Mez & Sodiro; Pflr. 572. PHY.
 SCEPTRIFORMIS Mez & Sodiro, Pflr. 546. ALL?
 SCHIEDEANA Steud.; L. B. Smith, North Am. Fl. 19: 150. 1938.
 SCHIMPERIANA Wittm.; Pflr. 541. ALL.
 SCHULTZEI Harms; Pflr. 550. ALL.
 SECUNDA H. B. K.; Pflr. 522. ALL.
 SEEMANNII (Baker) Mez; Pflr. 498. PS-C.
 SELERIANA Mez; Pflr. 492. TIL.
 SELLEANA Harms; Pflr. 535. ALL.
 SETACEA Sw.; L. B. Smith, Phytologia 8: 219. 1962. TIL.
 SIGMOIDEA L. B. Smith, Contr. U. S. Nat. Herb. 29: 440. 1951.
 ALL?
- SINGULARIS Mez & Wercklé; Pflr. 524. ALL.
 SINUOSA L. B. Smith, Pflr. 508. PS-C.
 Var. SINUOSA. Leaf-blades 20 mm wide. Inflorescence 30 cm long; branches ascending. Floral bracts 5-6 mm long.
 Var. QUIROZII Gilmartin, Phytologia 16: 162. 1968. Leaf-blades 15 mm wide. Inflorescence 7 cm long (normal?); spikes recurved. Floral bracts 6-7 mm long.
 SOCIALIS L. B. Smith, Phytologia 6: 257. 1958. TIL.
 SODIROI Mez; Pflr. 545. ALL.
 SOMNIANS L. B. Smith, Phytologia 7: 422. 1961. ALL?
 SPATHACEA Mez & Sodiro; Pflr. 483. TIL? VRIESEA?
 SPHAEROCEPHALA Baker; Pflr. 567. ALL.
 SPICULOSA Griseb.; Pflr. 504. PS-C.
 Var. SPICULOSA. Leaf-blades merely spotted or concolorous. Inflorescence usually tripinnate; spikes densely flowered at least toward apex. Floral bracts (5-) 6-9 mm long, mostly more than twice as long as the internodes.
 Var. USTULATA (Reitz) L. B. Smith, Phytologia 19: 288. 1970. Leaf-blades irregularly cross-banded with dark purple. Inflorescence usually bipinnate; spikes densely flowered at least toward apex. Floral bracts (5-) 6-9 mm long, mostly more than twice the internodes.
 Var. MICRANTHA (Baker) L. B. Smith, l. c. Spikes laxly flowered at maturity. Floral bracts 4-5 mm long, mostly less than twice the internodes.
- SPRENCELIANA Kl.; Pflr. 560. ANO.
 STANDLEYI L. B. Smith; Pflr. 541. ALL?
 STEIROPODA L. B. Smith, Phytologia 6: 257. 1958. TIL.
 STENOGLOSSA L. B. Smith, Fieldiana Bot. 28: 151. 1951. PS-C.
 STENOURA Harms, Notizblatt 12: 537. 1935. ALL.
 Var. STENOURA. Inflorescence bipinnate; spikes with sterile

base 1-3 cm long and 1-3-bracteate. Floral bracts not over 30 mm long.

Var. GONZALEZII Gilmartin, *Phytologia* 16: 155. 1968. Inflorescence tripinnate; spikes subsessile. Floral bracts 27-30 mm long.

Var. MAUROI Gilmartin, op. c. 156. Inflorescence 25 cm long, 10 cm wide; spikes erect, 5-10 cm long. Floral bracts 30-35 mm long.

STIPITATA L. B. Smith, *Phytologia* 5: 40. 1954. ALL?

STRAMINEA H. B. K.; Pflr. 531. PHY.

STREPTOCARPA Baker; Pflr. 577. PHY.

STREPTOPHYLLA Scheidw.; Pflr. 488. TIL.

STRICTA Soland.; Pflr. 561. ANO.

Var. STRICTA. Flowers polystichous.

Var. DISTICHA L. B. Smith, *Arq. Bot. Est. S. Paulo* II. 1: 115. 1943. Flowers distichous.

STROBILIFERA E. Morr. ex Baker; Pflr. 480. TIL.

SUBALATA André; Pflr. 507. PS-C.

SUBCONCOLOR L. B. Smith, sp. nov. A T. wurdackii L. B. Smith, cui affinis, foliorum laminis supra subdense lepidotis, inflorescentia pauciramosa, spicis multifloris differt.

PLANT stemless, flowering 1.2 m high. LEAVES to 65 cm long, covered beneath with fine appressed cinereous scales; sheaths ovate, indistinct, 9 cm long, dark castaneous; blades subligulate to narrowly triangular, attenuate, 45 mm wide, subdensely cinereous-lepidote above. SCAPE erect, 1 cm in diameter, densely lepidote; scape-bracts imbricate, lanceolate, the upper short-caudate, lepidote toward apex. INFLORESCENCE typically of 4 spikes, lax; primary bracts ovate, apiculate, to 6 cm long, much exceeding the short bracteate sterile bases of the branches; spikes ascending, oblong, 13 cm long, 25 mm wide, strongly complanate with flat sides. FLORAL BRACTS densely imbricate, elliptic, acute, to 30 mm long, exceeding the sepals, carinate, coriaceous, even, lepidote at apex; flowers subsessile. SEPALs lance-oblong, acute, 24 mm long, glabrous, faintly nerved, the posterior short-connate; petal-blades elliptic, 8 mm long, pale violet; stamens included. Pl. I, fig. 10: Spike x 1/2; fig. 11: Sepals x 1.

PERU: CUZCO: epiphytic, Quillabamba, Rauh 20811 (US, type).

SUBULIFERA Mez; Pflr. 490. TIL.

SUESCANA L. B. Smith, *Contr. U. S. Nat. Herb.* 29: 441. 1951. ALL.

SUPERBA Mez & Sodiro; Pflr. 534. ALL.

TECTORUM E. Morr.; Pflr. 531. ALL.

TENUIFOLIA L.; L. B. Smith, *Phytologia* 8: 219. 1962. ANO.

Var. TENUIFOLIA. Leaves scarcely or not secund, usually exceeding the inflorescence; sheaths not distinct. Flowers polystichous.

Var. DISTICHA (L. B. Smith) L. B. Smith, *Phytologia* 8: 220. 1962. As the typical but flowers distichous.

Var. SURINAMENSIS (Mez) L. B. Smith, l. c. Leaves usually secund but divergent from each other, exceeded by the inflores-

cence; sheaths indistinct. Flowers polystichous.

Var. *SAXICOLA* (L. B. Smith) L. B. Smith, l. c. Leaves very densely secund, pressed together; sheaths indistinct. Flowers polystichous.

Var. *VAGINATA* (Wawra) L. B. Smith, l. c. Leaf-blades involute and thus contrasting with the sheaths, often spreading, much shorter than the long branching stem. Flowers polystichous.

TENUISPICA André; Pflr. 515. PS-C.

TERES L. B. Smith, *Phytologia* 16: 78. 1968. TIL.

TETRANTHA R. & P.; Pflr. 501. PS-C.

Var. *TETRANTHA*. Inflorescence laxly bipinnate. Floral bracts minute or wanting.

Var. *AURANTIACA* (Griseb.) L. B. Smith, *Contr. Gray Herb.* 89: 15. 1930. Scape-bracts mostly shorter than the internodes. Inflorescence bipinnate, long, lax; primary bracts often shorter than the spikes, orange to dark brown; spikes lax. Floral bracts half as long as the sepals.

Var. *DENSIFLORA* (André) L. B. Smith, l. c. Scape-bracts imbricate. Inflorescence bipinnate, short, dense; primary bracts orange to dark brown. Floral bracts about half as long as the sepals.

Var. *SCARLATINA* (André) L. B. Smith, l. c. Leaves coriaceous, firm. Inflorescence bipinnate, long, lax; primary bracts exceeding the spikes, bright red or rarely pale greenish yellow. Floral bracts about half as long as the sepals.

Var. *MINIATA* (André) L. B. Smith, l. c. Leaves soft, flexible. Inflorescence bipinnate, mostly small, compact; primary bracts exceeding the spikes, bright red or rarely pale greenish yellow. Floral bracts about half as long as the sepals.

Var. *RAMOSIOR* L. B. Smith, *Phytologia* 13: 147. 1966. Inflorescence laxly tripinnate; rhachis neither angled nor geniculate; primary and floral bracts large.

THYRSIGERA Baker; L. B. Smith, *North Am. Fl.* 19: 131. 1938. TIL.

TOVARENSIS Mez; Pflr. 520. ALL.

TRAPEZIFORMIS Mez; Pflr. 498. PS-C.

TRICHOLEPIS Baker; Pflr. 587. DIA.

Var. *TRICHOLEPIS*. Stem short. Leaves not over 15 mm long.

Var. *MACROPHYLLA* L. B. Smith, *Lilloa* 14: 98. 1948. Stem becoming long and much branched. Leaves to 50 mm long.

TRICOLOR Schlecht. & Cham.; Pflr. 469. TIL.

Var. *TRICOLOR*. Plant 30-40 cm high. Leaf-sheaths concolorous.

Var. *MELANOCRATER* (L. B. Smith) L. B. Smith, *Journ. Washington Acad. Sci.* 43: 68. 1953. Plant not over 25 cm high. Leaf-sheaths concolorous.

Var. *PICTA* L. B. Smith, *Contr. Gray Herb.* 154: 38. 1945. Leaf-sheaths more or less pale-maculate.

TRIGLOCHINOIDES Presl; Pflr. 572. PHY.

TRIPINNATA (Baker) Mez; Pflr. 503. PS-C.

TRUNCATA L. B. Smith, *Contr. U. S. Nat. Herb.* 29: 530. 1954. ALL.

TRUXILLANA L. B. Smith, *Phytologia* 8: 503. 1963. ALL.

TURNERI Baker; Pflr. 546. ALL.

Var. TURNERI. Plant 40-50 cm high. Inflorescence much branched, compact. Sepals 18-20 mm long.

Var. ORIENTALIS L. B. Smith, Mem. N. Y. Bot. Gard. 9: 421. 1927. Plant 15-40 cm high. Inflorescence few branched or simple compact. Sepals 13-15 mm long.

Var. PATENS L. B. Smith, Phytologia 16: 462. 1968. Inflorescence subcylindric, subclax, to 30 cm long; branches spreading.

ULTIMA L. B. Smith, Contr. U. S. Nat. Herb. 29: 442. 1951.

ALL?

UMBELLATA André; Pflr. 575. PHY.

USNEOIDES (L.) L.; Pflr. 594. DIA.

Var. USNEOIDES. (Pflr. 595).

Var. FILIFORMIS André; Pflr. 596.

Var. FERRUGINEA André; l. c.

Var. LONGISSIMA André; l. c.

Var. ROBUSTA E. Morr. ex Mez; l. c.

Var. CRETACEA Mez, l. c. All of difficult distinction and doubtful value.

UTRICULATA L.; Pflr. 459. TIL.

UYUCENSIS Gilmartin, Ceiba 11: 23. 1965. ALL.

Forma UYUCENSIS. Plant to 50 cm high. Leaves to 32 cm long, mostly green.

Forma MINOR Gilmartin, Ceiba 11: 23. 1965. Plant only about 25 cm high. Leaves 20-25 cm long, reddish.

VALENZUELANA A. Rich.; Pflr. 486. TIL.

VENUSTA Mez & Wercklé; Pflr. 576. PHY.

VERNICOSA Baker; Pflr. 528. ANO.

VICENTINA Standl.; Pflr. 484. TIL.

Var. VICENTINA. Floral bracts covered with appressed cinereous scales.

Var. GLABRA L. B. Smith, var. nov. A var. vicentina bracteis florigeris mox glabris differt.

MEXICO: CHIAPAS: Venustiano Carranza: on Quercus, north side of Aguacatenango near the lake, 1770 m alt, 28 January 1965, Raven & Breedlove 20098 (US, type).

VIOLACEA Baker; Pflr. 480. TIL.

VIOLASCENS Mez; Pflr. 546. ALL.

VIRIDIFLORA (Beer) Baker; Pflr. 455. PSA.

WAGNERIANA L. B. Smith, Phytologia 9: 254. 1963. PHY.

WALTERI Mez; Pflr. 553. ALL.

WERCKLEANA Mez; Pflr. 523. ALL?

WERDERMANNII Harms; Pflr. 555. ALL?

WURDACKII L. B. Smith, Phytologia 9: 254. 1963. ALL.

XEROGRAPHICA Rohweder, Senckenbergiana 34: 113. 1953. TIL.

XIPHIOIDES Ker-Gawl.; Pflr. 557. ANO.

Var. XIPHIOIDES. Leaf-scales mostly with broad lobes. Floral bracts to 7 cm long. Sepals to 42 mm long. Petals white.

Var. TAFIENSIS L. B. Smith, var. nov. A var. xiphioides foliis tomentosolepidotis, bracteis florigeris (5-6 cm) sepalisque (30 mm) minoribus, petalis violaceis differt. T. friesii sensu Castellanos, An. Mus. Hist. Nat. Buenos Aires 37: 501,

pl. 1. 1933.

ARGENTINA: TUCUMAN: Tafi: on algarrobo (Prosopis), Managua (Colalao del Valle), 2000 m alt, December 1931, Schreiter 7176 (US, type; LIL).

YUNCKERI L. B. Smith, Field Mus. Publ. Bot. 17: 322. 1938.
TIL?

*zamorensis L. B. Smith, Phytologia 4: 213. 1953. VRIESEEA ZAMORENSIS (L. B. Smith) L. B. Smith, comb. nov. The evidence for this species being a Vriesea was overlooked until too late to include it in my key correctly. The combination is based on the evidence of Blass in herb. Rauh 17729 from Ecuador.

ZARUMENSIS Gilmartin, sp. nov. Vriesea petream (L. B. Smith) L. B. Smith valde simulans sed petalorum ligulis non visis et floribus majoribus, bracteis florigeris subduplo longioribus angustioribus carinatis differt.

PLANT ca. 70 cm tall, epiphytic. LEAVES 40-50 cm long; sheaths 10-14 cm long by 8-10 cm wide, reddish brown; blades 34-45 mm wide, narrowly triangular, gray-green, densely subappressed lepidote above and below, apex caudate. SCAPE unknown. INFLORESCENCE fragmented but apparently compound; primary bracts 10 cm long by 3 cm wide, like the floral bracts but not carinate; spikes 30 cm long by 3.5 cm wide, glabrous, 20-30-flowered; rhachis alate. FLORAL BRACTS 11 cm long by 2.3 cm wide, erect, densely imbricate, narrowly ovate, obtuse, salmon-colored, nerved carinate, glabrous within and without. SEPALS 4 cm long by 1 cm wide, ovate, erect, ecarinate, nerved, free, glabrous within and without, acute; petals to 13 cm long, erect, green, turning yellow; stamens included by several mm; ovary 9 mm long by 7 mm in diameter, style many times longer than ovary, stigma included; distance between flowers ca 8 mm. Pl. II, fig. 1-3.

ECUADOR: EL ORO: between Corredores and Cashatambo, north of Zaruma (ca 3° 35' S, 79° 37' W), 2600 m alt, 10 September 1947, A. Espinosa 2229 (US, type).

SYNONYMS AND EXCLUDED NAMES

acroleuca Mez & Purpus; Pflr. 472 - TRICOLOR var. TRICOLOR.

aloifolia Hook.; Pflr. 462 - FLEXUOSA.

apoloensis Rusby; Pflr. 579 - STREPTOCARPA.

araeostachya Harms; Pflr. 511 - JENMANII.

arguta L. B. Smith, Phytologia 6: 440. 1959 - STENOURA var.

STENOURA

arnoldiana Harms; Pflr. 521 - TOVARENSIS.

arpocalyx André; Pflr. 482 - VRIESEEA A.

augustae-regiae Mez; Pflr. 548 - BIFLORA.

barclayana Baker; Pflr. 553 - VRIESEEA B.

bicolor Brongn.: Pflr. 566 - AERANTHOS.

brachypodia (E. Morr.) Mez; Pflr. 564 - TENUIFOLIA var.

VAGINATA

bradeana Mez & Tonduz; Pflr. 479 - BRACHYCAULOS.

brevispicula André; Pflr. 508 - SUBALATA.

brittoniana Baker; Pflr. 509 - SPICULOSA var. SPICULOSA

bromoides Mez; Pflr. 465 - SETACEA.
buchii Urb.; Pflr. 471 - FASCICULATA var. VENOSISPICA.
buchtienii H. Winkler; Pflr. 530 - RUSBYI
caespitosa Schlecht. & Cham.; Pflr. 458 - MULTICAULIS.
candelifera Rohweder, Senckenbergiana 34: 109. 1953 -

IMPERIALIS.

caricifolia E. Morr.; Pflr. 463 - FESTUCOIDES.
castaneo-bulbosa Mez & Wercklé; - Pflr. 491 - VRIESEA INCURVA.
cereicola Mez; Pflr. 487 - VRIESEA C.
chinchicuana Harms; Pflr. 506 - SPICULOSA var. MICRANTHA.
chontalensis Baker; Pflr. 527 - VRIESEA C.
coarctata Gill. ex Baker; Pflr. 587 - BRYOIDES
compressa Bertero; Pflr. 470 - FASCICULATA var. VENOSISPICA.
condensata Baker; Pflr. 580 - STREPTOCARPA.
confusa Hassler; Pflr. 581 - DURATII var. CONFUSA
confusa var. saxatilis Hassler; Pflr. 581 - DURATII var.

SAXATILIS.

cordobensis Hieron.; Pflr. 592 - CAPILLARIS f. CORDOBENSIS.
costaricana Mez & Wercklé; Pflr. 523 - EXCELSA.
cowellii Mez & N. L. Britton; Pflr. 550 - VRIESEA C.
crenulipetala Mez; Pflr. 533 - VRIESEA C.
cryptantha Baker; Pflr. 478 - BRACHYCAULOS.
cucaensis Wittm.; Pflr. 461 - MAKOYANA.
cyanea (A. Dietr.) Morr. ex Mez; Pflr. 521 - GUATEMALENSIS.
cyanescens Mez; Pflr. 563 - TENUIFOLIA var. VAGINATA.
cygnea Mez & Sodiro; Pflr. 483 - VRIESEA TEQUENDAMAE.
cylindrica S. Watson; Pflr. 480 - BOURGAEI.
decepiens André; Pflr. 510 - MULTIFLORA var. DECEPIENS
decomposita Baker; Pflr. 580 - DURATII var. SAXATILIS.
dependens Hieron. ex Mez; Pflr. 594 - CAPILLARIS f. HIERONYMII
depeana var. clavigera (Mez) L. B. Smith, Phytologia 5: 395.
1956 - CLAVIGERA.

var. costaricensis (Mez) L. B. Smith, Phytologia 5: 395. 1956-
OERSTEDIANA.

var. latifolia (Griseb.) L. B. Smith, Phytologia 5: 394. 1956-
FENDLERI var. FENDLERI.

var. reducta (L. B. Smith) L. B. Smith, Phytologia 5: 395.

1956 - FENDLERI var. REDUCTA.

var. tripinnata L. B. Smith, Phytologia 5: 49. 1954 - FENDLERI
var. FENDLERI.

dianthoidea Rossi; Pflr. 565 - AERANTHOS.

var. grisea Guillaumin, Bull. Mus. Nat. Hist. Nat. Paris 19,
pt. 4: 353. 1947, nom. illeg., not seen, but probably equals T.
BERGERI.

didistichoides Mez; Pflr. 526 - VRIESEA D.

dielsii Harms, Notizblatt 12: 534. 1935 - PENDULISPICA.

digitata Mez; Pflr. 483 - VRIESEA INCURVA.

distachya Baker; Pflr. 486 - ?

domingensis Mez; Pflr. 485 - VALENZUELANA.

dubia L. B. Smith, Phytologia 5: 284. 1955 - VRIESEA DUBIA.

ehrenbergii Kl. ex Beer, Brom. 264. 1857, nomen; Mez, DC. Mon.

- 0: 727. 1896. description; Pflr. 495 - EHRENBURGIANA.
ekmanii Harms; Pflr. 461 - PANICULATA
elata Baker; Pflr. 519 - VRIESEAE E.
erubescens Schlecht. Linnaea 18: 427. 1844 - ?
erubescens sensu Mez; Pflr. 496 - IONANTHA var. IONANTHA
espinosae L. B. Smith, Contr. U. S. Nat. Herb. 29: 498. 1951 -
 VRIESEAE E.
eosma Spegazzini; Pflr. 582 - REICHENBACHII.
exaltata Mez, Pflr. 520 - VRIESEAE ELATA.
exigua Ule; Pflr. 513 - PARVIFLORA.
favillosa Mez; Pflr. 583 - PALEACEA.
fendleri (Baker) Mez, non Griseb.; Pflr. 500 - CARIBAEA.
ferruginascens Mez; Pflr. 500 - CARIBAEA.
firmula Mez; Pflr. 565 - TENUIFOLIA var. SURINAMENSIS.
flammea Mez; Pflr. 478 - BRACHYCAULOS.
fluminensis Mez; Pflr. 568 - GARDNERI.
fragrans André; Pflr. 550 - VRIESEAE F.
fulgens (Kl.) Mez; Pflr. 501 - TETRANTHA var. AURANTIACA.
funkiana Baker; Pflr. 496 - ANDREANA.
fusca Baker; Pflr. 495 - PALEACEA.
fusco-guttata Mez; Pflr. 550 - IONOCROMA.
glaucophylla (Hook.) Baker; Pflr. 471 - FASCICULATA var.
 FASCICULATA.
goyazensis Mez; Pflr. 528 - DIDISTICHA.
gracilis Ule; Pflr. 524 - VRIESEAE GRACILIS var. TENUIS.
grisebachiana Baker; Pflr. 549 - BIFLORA.
guanacastensis Standl.; Pflr. 513 - CONTORTA.
guentheri Harms; Pflr. 530 - RUSBYI.
hahnii Mez; Pflr. 479 - FOLIOSA.
harmsiana L. B. Smith; Pflr. 533 - VRIESEAE HARMSIANA.
herrerae Harms; Pflr. 554 - WALTERI.
herzogii Wittm.; Pflr. 582 - REICHENBACHII.
heterandra André; Pflr. 532 - VRIESEAE H.
hieronymi Mez; Pflr. 592 - CAPILLARIS f. HIERONYMII.
hitchcockiana L. B. Smith; Pflr. 485 - VRIESEAE H.
incurva Griseb.; Pflr. 481 - VRIESEAE I.
inflata Mez; Pflr. 457 - MOOREANA.
ingens Mez; Pflr. 458 - VRIESEAE SANGUINOLENTA.
intermedia Mez; Pflr. 488 - CIRCINNATA.
juruaana Ule; Pflr. 490 - PARAENSIS.
krameri (E. Morr.) Baker; Pflr. 562 - STRICTA var. STRICTA.
kunthiana Meyen; L. B. Smith, Phytologia 7: 108. 1960; 13:
 141. 1966. - LATIFOLIA var. LATIFOLIA.
 var. major (Mez) L. B. Smith, l. c. - LATIFOLIA var. MAJOR.
 var. divaricata (Benth.) L. B. Smith, l. c. - LATIFOLIA var.
 DIVARICATA.
lanata Mez; Pflr. 583 - PALEACEA.
lateritia André; Pflr. 553 - VRIESEAE BARCLAYANA.
latispala L. B. Smith; Pflr. 560 - POHLIANA.
lilacina Mez; Pflr. 551 - LEIBOLDIANA.
lindeniana Regel; Pflr. 573 - LINDENII.
mandonii E. Morr. ex Mez; Pflr. 590 - CROCATA.

- melanopus E. Morr. ex Baker; Pflr. 467 - TRICOLOR var. MELANO-CRATER.
- mezii André ex Mez; Pflr. 499 - SEEMANNII var. MEZII.
- micrantha Baker; Pflr. 506 - SPICULOSA var. MICRANTHA.
- microxiphion Baker; Pflr. 566 - AERANTHOS.
- miniatispica Rohweder, Senckenbergiana 34: 110. 1953 - CRYPTO-
PODA.
- minor Mez & Sodiro; Pflr. 539 - LATIFOLIA var. DIVARICATA.
- modesta Mez; Pflr. 481 - FOLIOSA.
- monobotrya Mez; Pflr. 571 - MONODELPHA.
- monstrum Mez; Pflr. 573 - VRIESEA M.
- morreniana Regel; Pflr. 574 - CYANEA.
- multifolia Mez; Pflr. 547 - TURNERI var. ORIENTALIS.
- murorum Mez; Pflr. 538 - LATIFOLIA var. LATIFOLIA.
- orthiantha Standl.; Pflr. 500 - ADPRESSA var. ORTHIANTHA.
- palmana Mez; Pflr. 504 - SPICULOSA var. SPICULOSA.
- patula Mez; Pflr. 487 - VRIESEA P.
- pavonii Mez; Pflr. 525 - MONOTAGMA LAXUM (Poepp. & Endl.) K.
Schum., Marantaceae.
- pereziana André; Pflr. 485 - VRIESEA P.
- petraea L. B. Smith, Contr. U. S. Nat. Herb. 29: 427. 1951 -
VRIESEA P.
- plicatifolia Ule; Pflr. 499 - CRISPA.
- pulchella Hook.; Pflr. 563 - TENUIFOLIA var. TENUIFOLIA.
- pulvinata E. Morr. ex Baker; Pflr. 460 - DASYLIRIIFOLIA.
- pungens Mez; Pflr. 468 - FASCICULATA var. FASCICULATA.
- purpusii Mez; Pflr. 526 - VALENZUELANA.
- pusilla Gill. ex Baker; Pflr. 593 - CAPILLARIS f. VIRESCENS.
- rectiflora André; Pflr. 515 - FRASERI.
- recurvifolia Hook.; Pflr. 561 - ROSEA.
- regnellii Mez; Pflr. 568 - GARDNERI.
- rhodocincta Baker; Pflr. 540 - TURNERI var. ORIENTALIS.
- robusta Griseb.; Pflr. 487 - VRIESEA R.
- rubra R. & P.; L. B. Smith, Phytologia 13: 120. 1966 - VRIESEA
RUBRA.
- rubra sensu L. B. Smith, Contr. Gray Herb. 95: 46. 1931; Pflr.
457 - FENDLERI var. FENDLERI.
- var. costaricensis Mez; Pflr. 458 - OERSTEDIANA.
- var. fendleri (Griseb.) Mez; Pflr. 458 - FENDLERI var.
FENDLERI.
- var. reducta L. B. Smith, Fieldiana Bot. 28: 151. 1951 -
FENDLERI var. REDUCTA.
- rupestris Mez; Pflr. 581 - ARHIZA.
- sanctae-crucis Spencer-Moore; Pflr. 483 - PARAENSIS.
- saxicola Mez; Pflr. 530 - TECTORUM.
- scalarifolia Baker; Pflr. 582 - PALEACEA.
- schreiteri Lillo & Castellanos; Pflr. 540 - SPHAEROCEPHALA.
- schumanniana (Wittm.) Mez; Pflr. 500 - ADPRESSA var. TONDUZI-
ANA.
- scorpiura Mez; Pflr. 503 - PFENDULISPICA.
- simulata Small; L. B. Smith, North Am. Fl. 19: 133. 1938;
Phytologia 13: 454. 1966 - BARTRAMII.

- soratensis Baker; Pflr. 577 - STREPTOCARPA.
sordida Salisb. Prodr. 247. 1796. "folia rare ciliato-spinosa." Therefore not Tillandsioideae. Pflr. 608.
spuria Mez & Wercklé; Pflr. 491 - VRIESEA CHONTALENSIS.
stolpii Phil.; Pflr. 593 - CAPILLARIS f. VIRESCENS.
subimbricata Baker; Pflr. 525 - ELONGATA var. SUBIMBRICATA.
sublaxa Baker; Pflr. 485 - VALENZUELANA.
subulata E. Morr. ex Baker; Pflr. 493 - CHAETOPHYLLA.
tenuifolia sensu Mez, non L.; Pflr. 464 - SETACEA.
tephrophylla Harms; Pflr. 477 - CAPITATA.
tequendamae André; Pflr. 544 - VRIESEA T.
tonduziana Mez; Pflr. 512 - ADPRESSA var. TONDUZIANA.
triangularis Rusby; Pflr. 507 - PENDULISPICA.
tristis Mez; Pflr. 516 - RIOCREUXII.
triticea Burchell ex Baker; Pflr. 506 - SPICULOSA var. USTULATA.
tucumanensis Mez; Pflr. 580 - REICHENBACHII.
tuerckheimii Mez; Pflr. 523 - VRIESEA T.
uhdei Mez; Pflr. 474 - THYRSIGERA.
ulei Mez; Pflr. 536 - RUSBYI.
unca Griseb.; A. Hunziker, Trab. Mus. Bot. Univ. Cordoba 2: 299. 1960 - AERANTHOS.
unca sensu Mez; Pflr. 556 - ARGENTINA.
undulifolia Mez; Pflr. 499 - CRISPA.
variegata Schlecht.; Pflr. 489 - BUTZII.
venusta Silveira, non Mez & Wercklé; Pflr. 638 - GARDNERI.
vestita Schlecht. & Cham.; Pflr. 495 - SCHIEDEANA.
virescens R. & P.; Pflr. 594 - CAPILLARIS f. VIRESCENS.
virginalis E. Morr.; Pflr. 457 - HETEROPHYLLA.
wangerinii Mez; Pflr. 543 - IONOCROMA.
weberbaueri Mez; Pflr. 512 - PARVIFLORA.
williamsii Rusby; Pflr. 592 - CAPILLARIS f. VIRESCENS.
zamorensis L. B. Smith, Phytologia, 4: 213. 1953 - VRIESEA Z.

MISCELLANEOUS NOTES

Thanks to a steady influx of material I find myself in the anomalous but not wholly unfamiliar position of writing a supplement to an unpublished paper. In this case, new species of Encholirium and Dyckia arrived after my monograph manuscript passed the point of no return.

AECHMEA MOLLIS L. B. Smith, sp. nov. Ab omnibus speciebus inflorescentia bipinnata subglobosa lanata, sepalis serrulato-alatis differt.

LEAVES rosulate, to 5 dm long; sheaths elliptic, 11 cm long, subdensely brown-lepidote; blades ligulate, narrowed toward base, subacute with a terminal mucro 7 mm long, obscurely pale-lepidote beneath, glabrous above, laxly serrulate. SCAPE 7 cm long; scape bracts densely imbricate, the upper elliptic, apiculate. INFLORESCENCE bipinnate, densely subglobose, 6 cm wide, densely and finely brown-lanate with only primary bracts and petal-blades visible; primary bracts ovate, acute, mucronate, about equaling

the lower spikes, purplish; spikes dense with the few flowers apparently polystichous. FLORAL BRACTS suborbicular, mucronulate, serrulate, about equaling the sepals, thin, nerved; flowers sessile. SEPALS strongly asymmetric, 12 mm long, connate for 3 mm, mucronulate, the keel alate and serrulate; petals yellow, bearing 2 suborbicular scales at base; ovary compressed and with serrulate wings continuing those of the sepals, epigynous tube 3 mm long. Pl. II, fig. 7: Sepals and ovary (without indument) x 1; fig. 8: Sepal extended x 1.

BRAZIL: BAHIA: terrestrial, bank of Rio Una, near Una, 7 June 1968, R. P. Belem 3684 (US, type; NY).

DYCKIA LIMAE L. B. Smith, sp. nov. D. velascae Mez in systemate meo affinis sed rhachi floribusque valde gracilioribus differt.

PLANT flowering 7-8 dm high. LEAF (only one known) 24 cm long; sheath suborbicular, 35 mm wide, stramineous at base, dark brown and densely serrulate at apex; blade narrowly triangular, curved, 15 mm wide, pungent, laxly serrate with antrorse and retrorse uncinata slender brown spines 2 mm long, covered on both sides with pale appressed scales. SCAPE nearly straight, 3 mm in diameter, glabrous; scape-bracts (except the lowest) triangular, small, remote, finely serrulate. INFLORESCENCE depauperately compound with 1 or 2 small suberect lateral branches, to 25 cm long, lax, covered with pale appressed scales except for the petals; rhachis slender, flexuous, compressed. FLORAL BRACTS ovate, acuminate, 6 mm long, the lowest serrulate and slightly exceeding the pedicels; flowers secund; pedicels rather stout but distinct, to 5 mm long in fruit. SEPALS ovate, broadly acute and apiculate, 7 mm long, sulcate; petals 12 mm long, orange, the blade elliptic-rhombic, obtuse, carinate; stamens included, filaments free above the 4 mm common tube; style ca 1 mm long. CAPSULE subglobose, 15 mm long. Pl. II, fig. 9: Flower x 1; fig. 10: Sepal x 1; fig. 11: Pistil x 1.

BRAZIL: PERNAMBUCO: in compact nearly bare arenitic soil, slopes of the Chapada de São José, Buíque, 8° 34' S, 37° 12' W, 1 November 1961, A. Lima 61-3996 (IPA, type; US, photo).

DYCKIA PERNAMBUCANA L. B. Smith, sp. nov. D. encholirioides (Goud.) Mez in systemate meo affinis sed inflorescentiae indumento albido, sepalis late rotundatis, stigmatibus sessilibus differt.

PLANT flowering to 8 dm high. LEAF (only one known) 33 cm long; sheath reniform, 4 cm wide, dark brown, subentire; blade narrowly triangular, nearly straight, 20 mm wide, sublaxly serrate with antrorse uncinata spines 1 mm long, covered with appressed cinereous scales beneath, becoming wholly glabrous above. SCAPE nearly straight, 4 mm in diameter, soon glabrous; scape-bracts erect, the lower subfoliaceous, the upper narrowly triangular, shorter than the internodes, serrulate, pale-lepidote. INFLORESCENCE compound or simple, to 40 cm long, lax, except for the petals covered with appressed finely lacerate white scales; primary bracts like the upper scape-bracts, several times shorter than the long naked sterile bases of the suberect slender

branches. FLORAL BRACTS triangular-ovate, attenuate, more or less serrulate, those on the terminal or only axis to 10 mm long and exceeding the pedicels of the lower flowers, those on the lateral axes equaling or shorter than the pedicels; pedicels sub-cylindric, to 5 mm long; flowers scarcely if at all secund. SEPALs ovate, broadly rounded, 9 mm long, ecarinate, sulcate; petals 12 mm long, orange, the blades suborbicular, slightly carinate; stamens included, the filaments connate for 2 mm above the common tube; stigmas sessile. Pl. II, fig. 12: Flower x 1; fig. 13: Sepal x 1; fig. 14: Pistil x 1.

BRAZIL: PERNAMBUCO: half bare hill of gneiss, Propriedade (Estate) Bituri, Brejo da Madre de Deus, 8° 11' S, 36° 30' W, 5 February 1965, A. Lima 65-4275 (IPA, type; US, photo).

ENCHOLIRIUM ERECTIFLORUM L. B. Smith, sp. nov. A E. horrido L. B. Smith, cui affinis, pedicellis gracilibus, floribus sursum secunde versis, seminibus breviter caudatis differt.

PLANT flowering ca 2 m high. LEAVES rosulate, 1 m long; sheaths reniform, 10 cm wide, dark brown, densely pale-lepidote; blades very narrowly triangular, flat, 6 cm wide, repand-serrate with dark spines 5-10 mm long, covered beneath with whitish appressed scales, glabrous and lustrous above. SCAPE erect, stout, glabrous; upper scape-bracts triangular, shorter than the internodes. INFLORESCENCE lax, typically 9-branched, glabrous; primary bracts much shorter than the long naked sterile bases of the branches; branches spreading, to 6 dm long; racemes very dense with all the flowers upwardly secund. FLORAL BRACTS triangular-ovate, attenuate, 4 mm long; pedicels slenderly cylindric, 10 mm long, even. SEPALs ovate, obtuse, 8 mm long, densely nerved; petals oblong, 20 mm long, slightly shorter than the stamens. CAPSULE ovoid, 13 mm long, dark castaneous. Pl. II, fig. 15: Habit x 1/60; fig. 16: Flower x 1.

BRAZIL: PIAUI: on sandstone, slopes of Serra do Ibiapaba, Tianguá to Alto Alegre, 14 December 1966, A. Lima 66-4800 (US, type; IPA).

PORTEA PICKELII A. Lima & L. B. Smith, sp. nov. A P. kermesina K. Koch, cui affinis, foliorum spinis parvis, sepalis breviter connatis breviter mucronatis differt.

PLANT flowering ca 1 m high. LEAVES about equaling the inflorescence, green, densely and finely brown-lepidote; sheaths elliptic, 2 dm long; blades ligulate, rounded, retuse-cuspidate, 4 cm wide, laxly serrate with slender curved antrorse spines 2 mm long. SCAPE erect, ca 1 cm in diameter, lepidote; scape-bracts imbricate and closely enfolding the scape or the lowest lax, ovate, subacute and apiculate, densely appressed-lepidote. INFLORESCENCE clavate, bipinnate, 15 cm long, 4 cm in diameter; primary bracts imbricate, suborbicular, to 45 mm long, nearly covering the sepals, densely appressed-lepidote, entire; branches fasciculately few-flowered. FLORAL BRACTS broadly elliptic, much exceeding the ovary, subchartaceous, densely lepidote; flowers obscurely pedicellate. SEPALs strongly asymmetric with a broad semiorbicular wing, short-mucronate, 23 mm long, connate 1-2 mm, glabrous; petals incompletely known, the blades elliptic. 8 mm

long, white; stamens included, pollen grains 5-7-porate (! H. Robinson); ovary slenderly subcylindric, blending with the pedicel, epigynous tube 3 mm long. Pl. II, fig. 4: Inflorescence x 1/2; fig. 5; flower and bract x 1/2; fig. 6: Sepal x 1.

BRAZIL: PERNAMBUCO: in shade of low open woods, Forest of Camocim, Engenho São Bento, São Lourenço da Mata, 8° 04' S, 35° 14' W, 26 December 1963, A. Lima 63-4198 (IPA, type; US).

VRIESEA LIMAE L. B. Smith, sp. nov. A V. brassicoides (Baker) Mez, cui affinis, rhachidis internodiis gracilibus valde curvatis subteretibus, bracteis florigeris quam internodiis subduplo brevioribus differt.

PLANT stemless, flowering 5 dm high. LEAVES 3 dm long, completely covered with fine appressed brown-centered scales, tinged with dark purple; sheaths elliptic, ca 10 cm long, conspicuous, dark castaneous; blades narrowly triangular, attenuate, 25 mm wide. SCAPE erect, 3 mm in diameter, glabrous; scape-bracts small, remote, the lower caudate, the upper apiculate. INFLORESCENCE simple, lax, secundly 3-5-flowered, 5-9 cm long, glabrous outside; rhachis slender, subterete; internodes curved, 20-25 mm long. FLORAL BRACTS secund with the flowers, broadly ovate, apiculate or obtuse, 14 mm long, ecarinate, dark and nerved when dry; pedicels obconic, 6 mm long. SEPALS oblong, obtuse, 23 mm long, ecarinate, nerved when dry, densely lepidote inside; petals (immature) shorter than the sepals, bearing 2 acute scales at base. Pl. II, fig. 17: Inflorescence x 1/2; fig. 18: Sepal x 1.

BRAZIL: PERNAMBUCO: half-bare gneiss hill, Propriedade (Estato) Bituri, Brejo da Madre de Deus, 8° 11' S, 36° 30' W, 5 February 1965, A. Lima 65-4276 (IPA, type; US).

VRIESEA TUERCKHEIMII (Mez) L. B. Smith, emend. descr.: SCAPE erect, 10-15 mm in diameter; scape-bracts subfoliaceous, imbricate.

REPUBLICA DOMINICANA: without locality, cultivated July 1968, L. Ariza Julia s. n. (US).

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Washington, D. C., U. S. A.

Plate I



Fig. 1-3: *Tillandsia ecarinata*; 4, 5: *T. esseriana*; 6, 7: *T. glauca*; 8, 9: *T. limae*; 10, 11: *T. subconcolor*.

Plate II

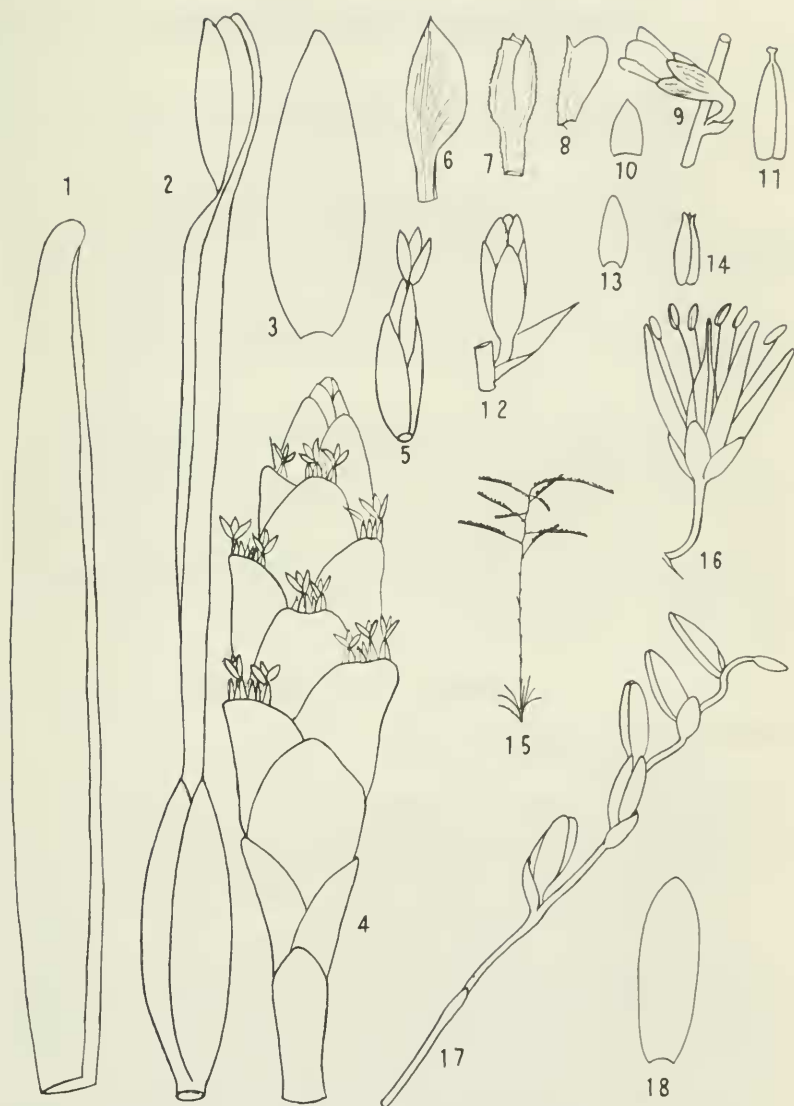


Fig. 1-3: *Tillandsia zarumensis*; 4-6: *Portea pickelii*; 7, 8: *Aechmea mollis*; 9-11: *Dyckia lima*; 12-14: *D. pernambucana*; 15, 16: *Encholirium erectiflorum*; 17, 18: *Vriesea lima*.